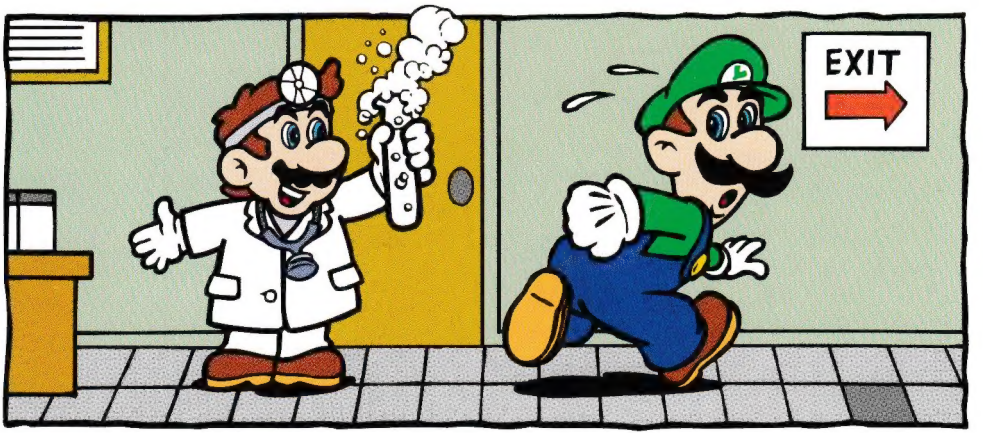
What do vaccines do?

MEDICINE

1. Protect against infection
2. Give infection
3. Cure infection



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Vaccines

We can protect ourselves against catching certain diseases by being vaccinated.

1 Vaccines protect us against infection.

Photo Seigneury Conseil

Even today, we don't have vaccines for every illness. Research is continually going on to find new vaccines for infections such as AIDS.

Disease Fighter

A vaccine is like an anti-germ barrier. If a germ gets into your system, certain white corpuscles called lymphocytes make weapons – antibodies– to fight off the invader.

Training Exercise

A vaccination is like a training exercise before a big battle. Scientists take the germ responsible for a particular disease, and render it harmless. Then they inject the germ into your body. Your body, thinking the germ is bad, produces the appropriate antibodies and stores its method of making them in its memory. Later, if the active germ should ever invade, your body will immediately manufacture whole armies of the antibodies, and they'll protect you from getting really ill. Someday, we hope to have vaccinations for all diseases.

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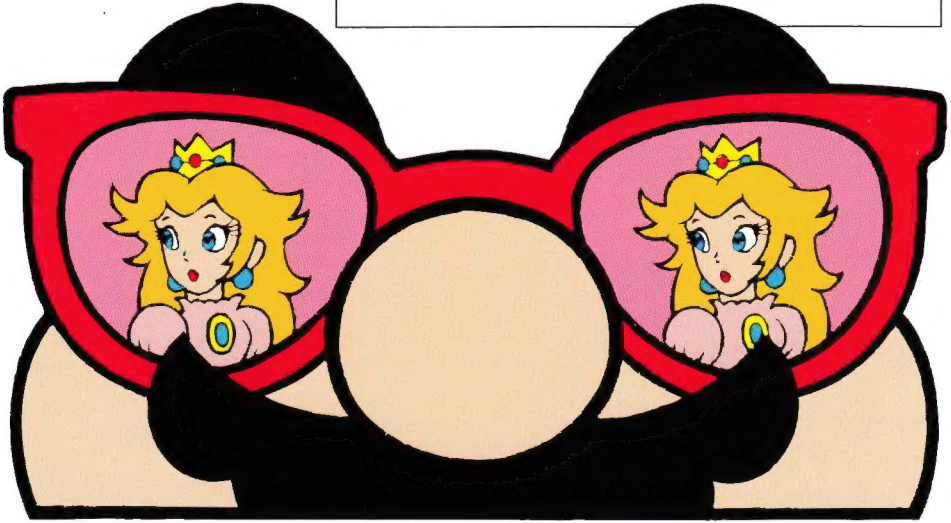
D3 054 03-12

Why do some people wear glasses?

MEDICINE

1. To protect their eyes
2. To see in color
3. To correct their eyesight



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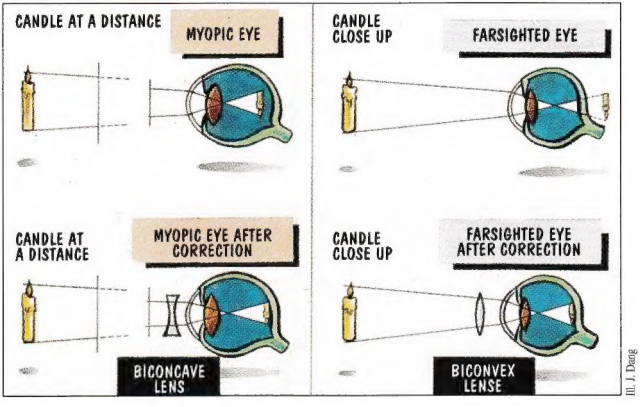
Glasses

Glasses correct faulty vision, like myopia (near-sightedness).

3 Glasses correct faulty eyesight.



Nearsightedness and farsightedness can be corrected by wearing glasses prescribed for the problem. You can't see through borrowed glasses!

Seeing Sphere

The eye contains a crystalline lens, through which all the images we see have to pass. But some people's vision is blurred or incorrect because there is a fault in the lens. So they go to an optician to get made-to-measure glasses or contact lenses to correct their vision problems.

Eyesight Varies

Vision problems vary. Nearsighted people are those who can see things close to them, but things farther away are blurred. Farsighted people can see things at a distance, but have trouble seeing things close up. Elderly people often suffer from far-sightedness as their eyes grow old. And people with astigmatism have trouble reading music or understanding designs and shapes, because they appear jumbled. And how are your eyes?

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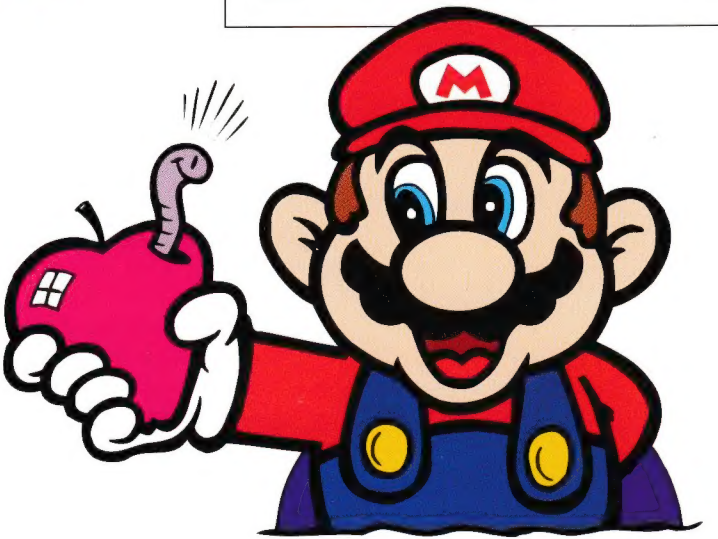
D3 054 03-13

Why should we include fruit as part of our daily diets?

MEDICINE

1. To get a good night's sleep
2. To have beautiful hair
3. To grow strong and stay healthy



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Fruit

Natural nutrients in fruit help us grow and keep us healthy. Essential elements are water, fiber, sugar, and vitamins.

3 **We should include fruit in our diets so we will grow strong and stay healthy.**

Photo © Floraprint

Raspberries help provide Vitamin C, an important element necessary to a total program of good health.

Water in fruit is essential—without water we can't exist. Fruit also supplies fiber to help in the digestive process. Natural sugars in fruit are a great source of energy. And fruit provides the vitamins essential for growth, good health, and an active mind.

Valuable Vitamins

There are many vitamins and each plays a different role in keeping us healthy. Our bodies don't store vitamins well, so we need vitamin-rich fruit in our daily diets. According to health experts, everyone should have at least 2-4 servings of fruit each day. And fruit that supplies Vitamins A and C is especially important for our good health.

A and C for Me

Vitamin A is important for healthy skin and eyes. Vitamin C prevents infections and helps the body heal. Fruit rich in Vitamins A and C may also help reduce the risk of cancer. Apricots and cantaloupe are high in Vitamin A. Strawberries, grapefruit, oranges, and kiwi are high in Vitamin C.

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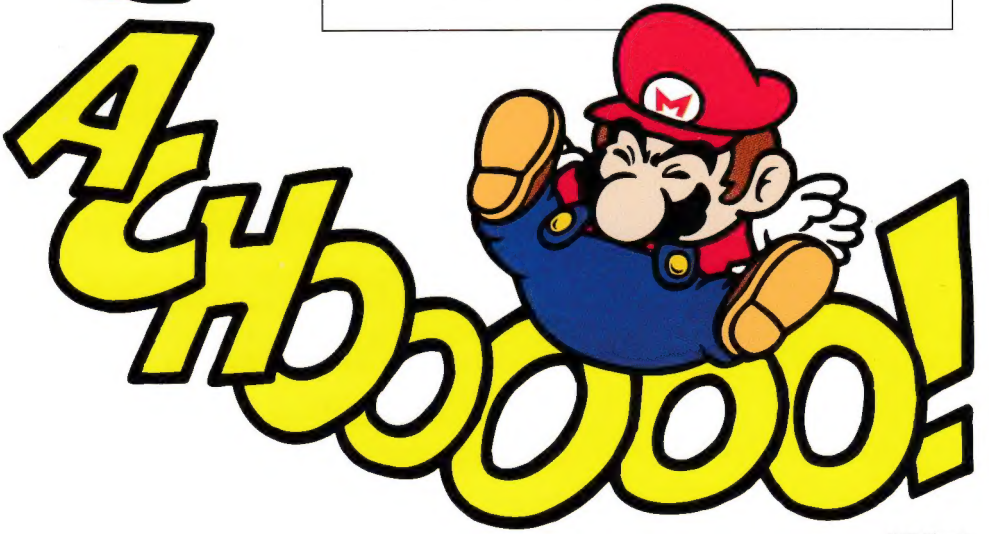
Why do we sneeze?

MEDICINE

1. To relieve pressure on our spines
2. To remove dust from our noses
3. To clean out our ears



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Sneeze

A sneeze is a sudden, violent rush of air out of the nose and mouth. It gets rid of irritating matter, like dust or pollen, in the nose.

2 We sneeze to remove dust from our noses.

Illustration © Irene Miedzinski

Do you shut your eyes when you sneeze?

Dust gets into your nose. Your body wants to get rid of it, so you sneeze. AH-choo! Air rushes from your nose and mouth as the sneeze blows the dust out. You should cover your mouth when you sneeze because a sneeze can blow germs out of your mouth and nose, too.

Reflex Reaction

No one can control sneezing. The body automatically takes this action to get rid of irritating or harmful substances in the nose. Sensitive nerve endings that line the nose react to foreign matter by causing the sneeze. Bright sunlight can also cause sneezing because eye nerves are closely connected to the nerve endings in the nose. Most people automatically shut their eyes when they sneeze. Because sneezing is a reflex action, many people say it's the closest thing to dying because during a sneeze, we have no control over our bodies. From this belief came the tradition of saying "Bless you" when someone sneezes!

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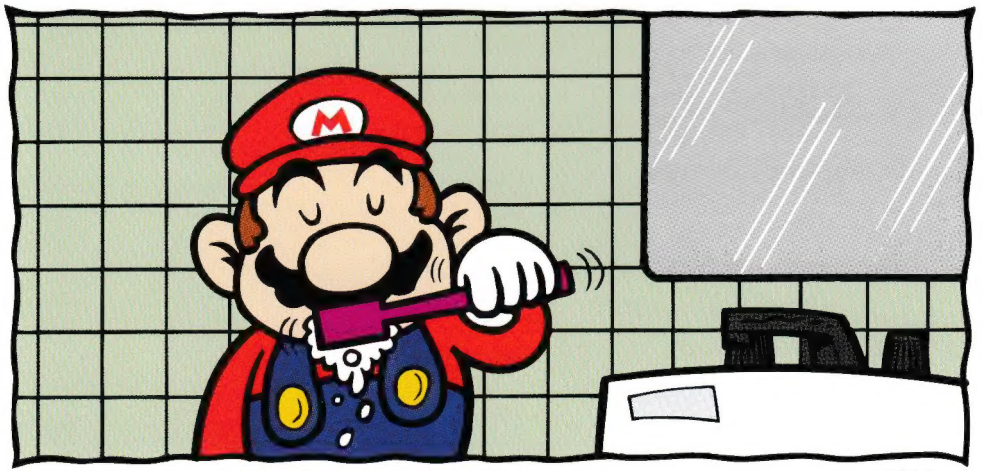
D3 054 09-08

Why should we brush our teeth?

MEDICINE

1. So we can speak
2. So we can avoid cavities
3. So we have teeth like fish



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Tooth Care

Brushing the teeth can eliminate most of the plaque that clings to them and causes tooth decay. Flossing, eating right, and getting regular dental checkups are essential, too.

2 We should brush our teeth to avoid the development of cavities.

Photo © Durrel / Explorer

It's never too early to start brushing and flossing your teeth regularly.

The film-like plaque on teeth mixes with bits of food to cause tooth decay, or cavities. But most of the germ-ridden plaque can be sent down the drain when you brush your teeth properly. You should brush your teeth regularly—after every meal if possible, but especially at night before going to bed.

Beware of Problems

About 70 percent of kids get at least one cavity by age 12, and 98 percent get one or more by age 18. To strengthen teeth against decay, eat a balanced diet, without too many between-meal sweet snacks, and use fluoride. If local water supplies don't contain fluoride, dentists can treat teeth with it. And dental checkups each year will help catch any problems as early as possible.

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D3 054 09-11

Which of these is a way to preserve food?

MEDICINE

1. Curing
2. Amalgamating
3. Factoring

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Food Preservation

Food preservation is any method that slows down the decay of food. Some common ones are curing, canning, refrigerating, and freezing.

1 Curing is one way food can be preserved.

Photo © Roy / Explorer

Salt is used to cure ham and other meat products.

Curing, one of the oldest methods of food preservation, involves adding ingredients like salt, sugar, and spices to food. Salt slows the growth of bacteria and removes some water from food. Sugar counteracts the hardening effect of salt, and spices are added mostly for flavor. Today curing is used to preserve foods like ham, pork, fish, and cucumbers.

Canned Foods

We are all familiar with canned foods. Canning food in airtight containers prevents spoiling and helps preserve flavor. Refrigerators keep food fresh and cold, and freezing food slows down bacteria growth and stops the breakdown of nutrients. We have small freezers at home, but manufacturers use air-blast freezers where fans create winter-like winds to preserve food by quick freezing it.

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D3 054 10-16

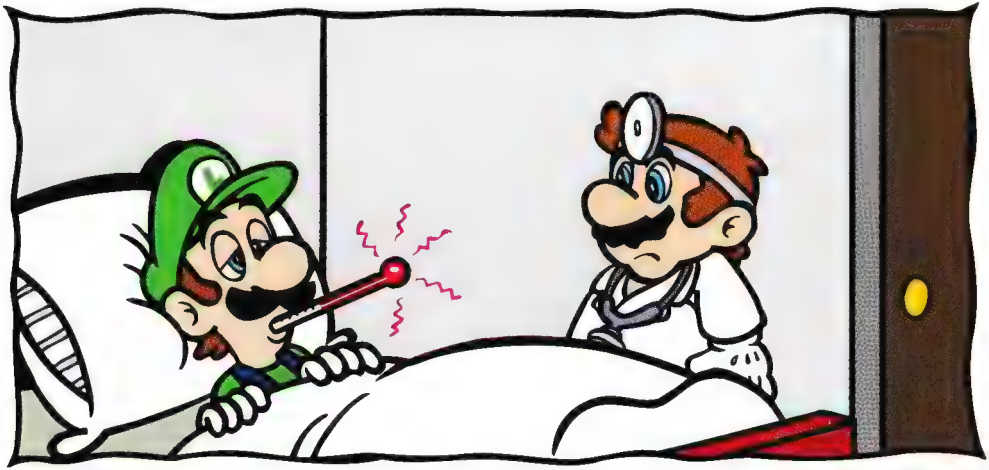
Why do we get a fever?

MEDICINE

1 To improve digestion

2 To fight against germs

3 To clear the eyes



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Fever

Fever is a condition in which your brain sets your body temperature higher than normal. It's the body's way of defending against invading germs or viruses.

2 Fever allows us to fight against germs.

Illustration © Mimi Perrotti

Medications like aspirin prevent germs from deregulating the hypothalamus, and so restore the temperature to normal.

One of the most common signs of disease is a fever. Scientists say the first fever appeared at least 300 million years ago. All vertebrates get a fever when infection, allergy, or a toxic reaction causes their brain temperature settings to rise.

Fever Facts

The hypothalamus is the part of the brain that controls your body temperature. Germs or viruses emit substances that affect the hypothalamus. Your body fights back with a fever—killing the germs with heat. Your body burns fat, there's a decrease in skin blood flow, and you shiver. In humans a temperature of 98.6° F (37° C) is considered normal. A temperature of 100°-102° F (37.7°-38.9° C) is considered a moderate fever. When people are severely ill, their temperature can rise even higher.

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D3 054 10-18

What is a sprain?

MEDICINE

1. A fractured bone
2. A torn ligament
3. A twisted muscle

©1995 Nintendo

Sprain

Our bodies are full of ligaments — strips of ropelike fibers that hold joint bones in proper position. A sudden twist can tear these ligaments, causing a sprain.

2 **A sprain is an injury, like a tear, to a ligament.**

Illustration © Mimi Perrotti

By using crutches, a person with a sprained ankle can walk without putting weight on the injured joint.

Suppose you're walking down the street and suddenly step off the curb and twist your ankle. That misstep causes the ligaments that hold your ankle joint in place to stretch and tear. Now you've got a sprained ankle!

Easing a Sprain's Pain

Most sprains occur in the ankle or wrist, but any joint can be affected. Sprains can cause extreme pain. The area where the sprain occurred may swell and turn black and blue. So what can you do to ease the pain of a sprain? Doctors prescribe rest and the elevation of the injured part to keep pressure off it. They also suggest applying cold compresses to the area or wrapping it in an elastic bandage to reduce swelling. If it hasn't healed within two weeks, the sprain could be very serious—the ligaments may be completely torn. In that case, doctors will need to operate in order to repair the injured ligaments.

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D3 054 12-06

Who performed the first open-heart surgery?

MEDICINE

1. Daniel Hale Williams
2. Ben Casey
3. Benjamin Franklin

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Daniel H. Williams

As a boy, Daniel Hale Williams (1856-1931) wanted to be a doctor. At age 27, this African-American earned his degree from Chicago Medical Hospital. Just 10 years later, he made medical history.

1 The first open-heart surgery was performed by Daniel Hale Williams.

Photo © Schomburg Center for Research in Black Culture

Daniel Hale Williams was the only black original member of the American College of Surgeons, founded in 1913.

Daniel Williams grew up at a time when it was difficult for African-Americans to succeed in the field of medicine. Although he was licensed, no hospital would allow a black doctor on its staff. So Williams set up Chicago's Provident Hospital, the first fully racially integrated hospital in the U.S.

A Life-Saving Technique

In 1893, James Cornish arrived at Provident Hospital near death. He'd been stabbed in the chest and the sac around his heart was torn. Dr. Williams opened Cornish's chest and sewed up the torn heart. Cornish not only survived, he lived for 20 years! President Grover Cleveland heard about the operation and made Williams chief surgeon at Freedman's Hospital in Washington, DC. There Williams started the first nursing school for African-Americans.

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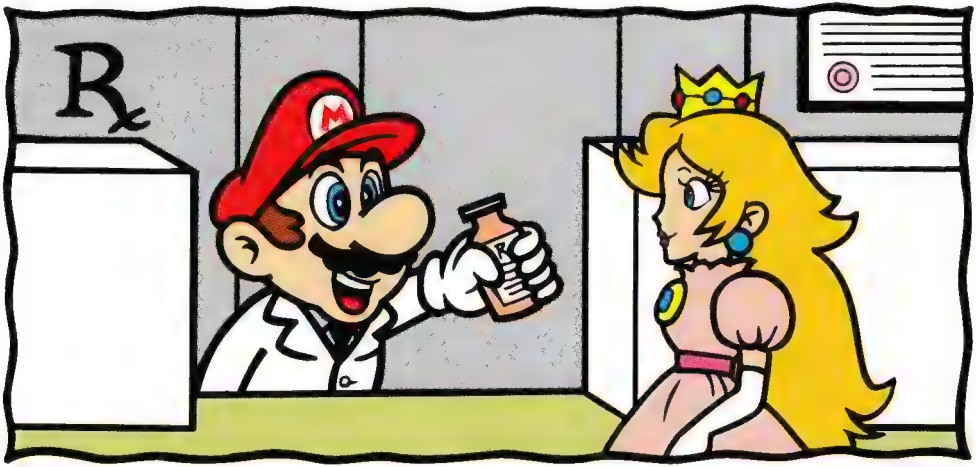
D3 054 12-10

What is a pharmacist?

MEDICINE

1. A person who mixes and sells medicine
2. A store where medicine is sold
3. A doctor who treats mental disorders



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Pharmacist

A pharmacist, or druggist, fills prescriptions written by doctors and dentists. The prescription may call for a medication manufactured by a large company or a special solution the pharmacist has to mix for the patient.

A pharmacist is a person who mixes and sells medicine.

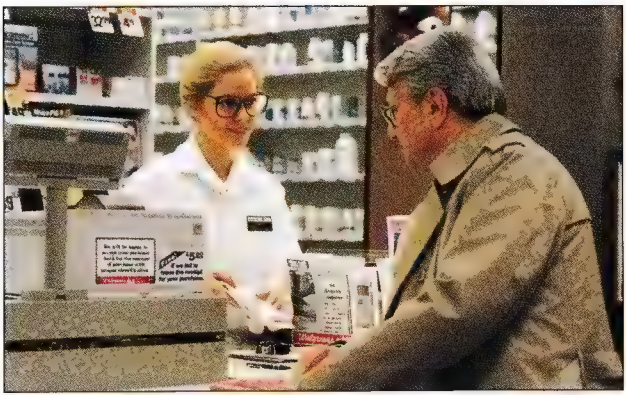

Photo © Walgreen Co

A local pharmacist may also have to prepare a medication that's not available from a pharmaceutical company.

At one time doctors prepared all medication for their patients. But as doctors became busier with patients, there wasn't time for mixing medicine. Instead they relied on local herbalists, specialists who prepared medications from plants. By the late 12th century, a new profession was born—apothecaries, who were commissioned to make and sell medications.

The Pharmacy

Today, pharmacists study for years to learn their highly specialized trade. Before they can practice, they must pass state examinations to become licensed. Some work in labs developing new medicines. Others work in neighborhood pharmacies filling prescriptions and often advising people on selecting over-the-counter medications.

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What causes seasickness?

MEDICINE

1. Salt air
2. Too much sun
3. Constant rhythmic motion of the body

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Motion Sickness

Seasickness is a form of motion sickness, a condition in which the rhythmic movement of a person's body, especially the head, while traveling in a car or on a train, ship, plane, or spaceship, causes nausea. (Most of our astronauts have experienced motion sickness in space!)

3 Constant rhythmic motion of the body causes seasickness.

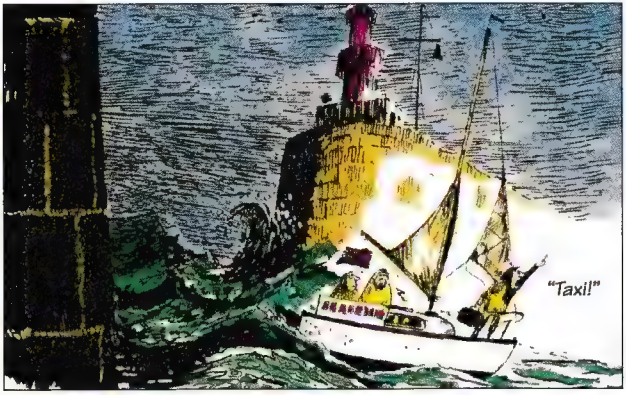

Photo © D.R.

Hunger and fatigue seem to promote motion sickness in some people.

Someone who's seasick may also become pale, sweat, feel cold or sleepy. If the motion continues, the person may vomit. Some people also belch, get headaches, or feel listless. Seasickness usually doesn't last more than a day or two, but sometimes it becomes bad enough to require a speedy return to shore.

Avoid Motion Sickness

Motion sickness results from the effects of motion on the inner ear, where the organs of balance are. So to avoid carsickness, seasickness, or other motion sickness, experts advise keeping head movements to a minimum. Hold your head against a headrest if possible and look at the distant horizon straight ahead. Sometimes it helps to sleep during car trips, or to make frequent stops to stretch your legs and settle your stomach.

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D3 054 16-20

What is cholesterol?

MEDICINE

1. A vitamin supplement
2. Iodized salt
3. Fat in the blood

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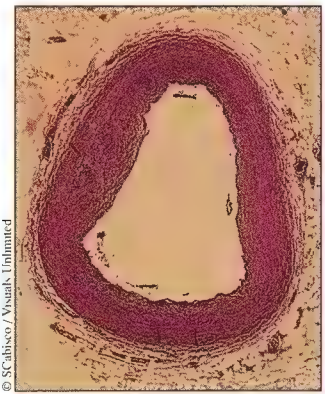
Cholesterol

Cholesterol, a fatty material our bodies produce, circulates in our blood. But cholesterol also enters our bodies in some foods that we eat.

3 Cholesterol is fat that circulates in our blood.



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Cross sections of two coronary arteries show advancing stages of build-up along the walls.

In small amounts, cholesterol helps the body. It's essential to life as an important part of the membrane of each body cell. The liver uses it to make acids used in the digestion process and to produce hormones. Besides the cholesterol the body makes, we consume cholesterol in some foods we eat. Cheese, butter, egg yolks, red meat, and organ meat such as liver contain high levels of cholesterol.

Kinds of Cholesterol

There are two kinds of cholesterol: HDL, or high-density lipoprotein and LDL, or low-density lipoprotein. High levels of LDL in the blood are the primary cause of heart attacks, because they clog arteries and restrict blood flow. LDL is found in saturated fats such as animal fats, so experts say to stay away from foods high in saturated fats. Doctors recommend we eat less than 300 milligrams of cholesterol per day. So it's important to balance your diet with plenty of fruits and vegetables, and other low-fat foods.

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D3 054 18-07

Which group helps people in times of disaster?

MEDICINE

1. The Federal Trade Commission
2. The Red Cross
3. The Academy of Arts and Sciences

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The Red Cross

The Red Cross, founded in Switzerland in 1864, is an international organization whose volunteers give food and clothing to victims of disasters like earthquakes, floods, hurricanes, or bombings and provide shelter for those who need it.

2 The Red Cross helps people in times of disaster.

© American Red Cross

An American Red Cross worker comforts a frightened child.

Besides disaster relief, the Red Cross teaches people what to do in emergency situations. It also teaches first aid and swimming classes and promotes safety.

American Red Cross

Clara Barton, a Civil War nurse, founded the American Association of the Red Cross in 1881. Today there are about 2,500 chapters of the American Red Cross, one in every U.S. county. The President is the honorary chairman of the Red Cross, which has over 10 million volunteers, including blood donors. The organization collects and distributes about 6 million units of blood a year, one-half the blood drawn in the U.S.

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Why do doctors say it's dangerous to smoke?

MEDICINE

1. It's habit-forming.
2. It can cause heart and lung diseases.
3. It can cause cancer.
4. All of the above.

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Smoking

Cigarettes contain a drug called nicotine, and cigarette smoke contains several chemical substances which can lead to serious, sometimes fatal diseases.

4 **Doctors say smoking is dangerous because it's habit-forming and has been linked to heart disease, lung disease, and cancer.**

More and more public places now display "NO SMOKING" signs.

People have smoked tobacco for centuries. It was part of some Indian religious ceremonies, and 16th-century Europeans thought smoking was beneficial to health. But after 1964, when medical research linked smoking to cancer and other diseases, the U.S. Surgeon General required cigarette makers to put labels on packages warning consumers, "smoking may be hazardous to your health."

Updated Reports

Further Surgeon Generals have confirmed the link between cigarette smoking and lung disease, heart disease, and cancer. Cigar and pipe smoking and chewing "smokeless" tobacco are linked to cancer of the mouth. A 30-year-old smoker shortens by six years his or her average life expectancy. Recent reports show secondary-smoke—what a smoker exhales—poses a threat to non-smokers. The best way to "kick the habit" is never to start!

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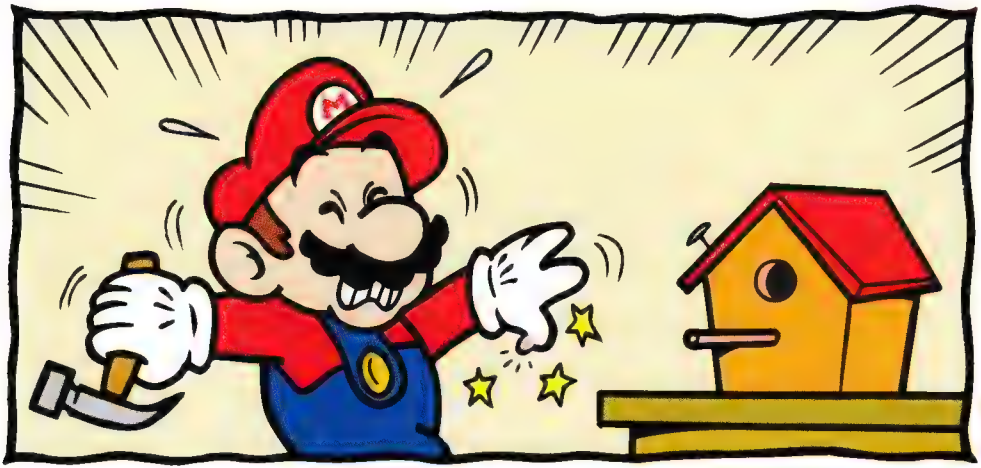
What is a hematoma?

MEDICINE

1. A sore throat
2. A bloody bump
3. A bloody scratch



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Body Injuries

A hematoma is an injury in which blood collects in one area. For example, if you're hit on the head, a blood-filled bump might appear and remain visible for a few days.

2 A hematoma is a bump filled with blood.

© B. Drake / Hoa-Qui

Football players' padding and helmets protect their bodies.

Beneath your skin is a network of blood vessels that channels blood to all parts of your body. If you're hit violently, some of the vessels burst and spill blood out into one area. Looking at your skin, you see a bump with a little pool of blood under it.

Bruises

The blood vessels in some parts of your body are further under the skin. So if you're hit hard in a soft, fleshy part of your body, the vessels burst but the blood spreads within the layer of flesh. You ache and your muscles hurt, but all you see on your skin is a black-and-blue bruise. You should quickly press a cold, wet towel on the spot to relieve some of the pain. Bruises usually go away after a few days. If any injury, especially a hematoma, doesn't improve within a few days, see your doctor.

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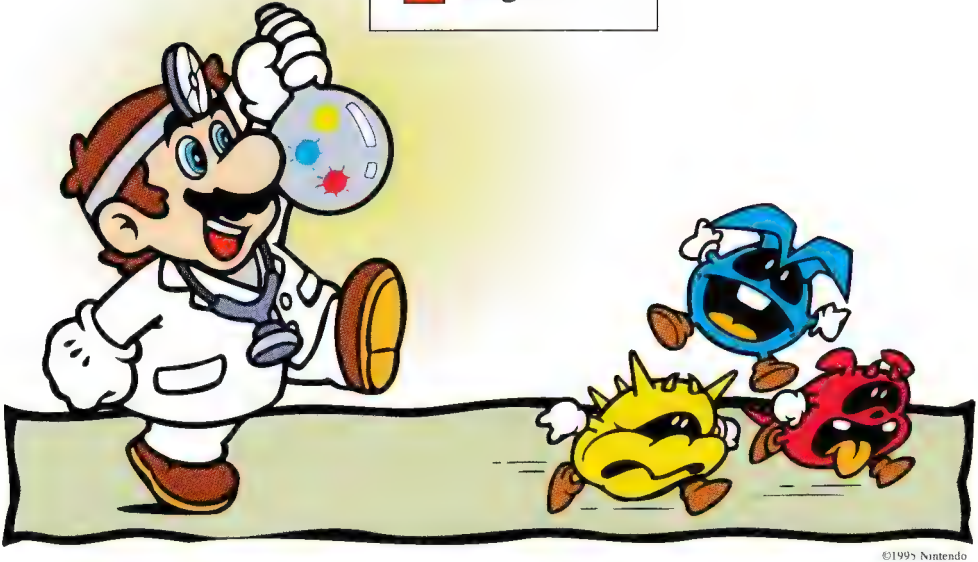
What is a virus?

MEDICINE

1 Bacteria

2 A spore

3 A germ



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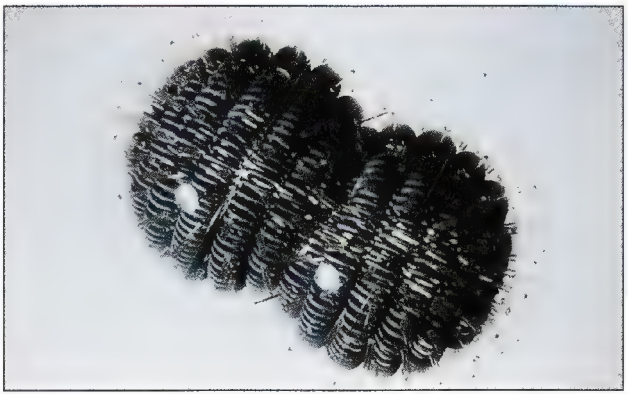
Viruses

Two types of germs cause disease: bacteria and viruses. A virus causes disease by invading a living cell and using it to make more viruses like itself.

3 A virus is a disease germ.



© F. Durand / Explorer

Bacteria are rod-, ball-, or spiral-shaped. Viruses may look like tadpoles, spirals with spider-like legs, or as with this flu virus, spiked balls.

Good health habits can help you get rid of many disease-causing bacteria. Viruses aren't as easily stopped. Doctors give shots to prevent viral diseases like polio, measles, and flu. But there's no shot to stop the cold virus, and to date there's no shot for HIV (Human Immunodeficiency Virus) that causes AIDS (Acquired Immune Deficiency Syndrome). If the flu virus attacks, the body's immune system fights it off. HIV attacks the immune system itself, leaving the body defenseless against other germs.

One Lock, One Key

Body cells and viruses are like locks and keys—only one key can invade or fit a lock. One virus attacks only muscle cells, causing muscular diseases such as polio; another attacks only nerve cells, causing nerve diseases such as Herpes zoster; and HIV attacks only immune system cells in the blood. Virologists are scientists who study viruses.

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D3 054 22/08

Which did Pasteur discover?

MEDICINE

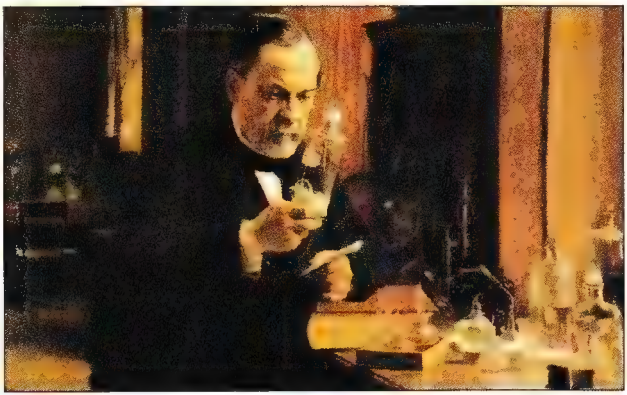
1. A vaccine to fight rabies
2. A vaccine to fight polio
3. A vaccine to fight Lyme Disease

©1995 Nintendo

Louis Pasteur

Chemist and microbiologist Louis Pasteur lived and worked in France. Besides a vaccine to fight the rabies virus, Pasteur developed a process to make milk and other food products safer to use.

1 Louis Pasteur (1822-1895) discovered a vaccine to fight rabies.



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Louis Pasteur's process of partially sterilizing milk to kill disease-producing germs was a giant step in stopping tuberculosis, a disease which took the lives of many young people.

Look on the side of a milk carton and you'll find the word "pasteurized." That means the milk was prepared using a method developed by Louis Pasteur, in which milk is partially sterilized to kill all disease-producing germs. Pasteur's process also kills harmless germs which don't make you sick but do sour milk. So pasteurized milk stays fresh longer.

Pasteur and Viruses

Pasteur believed that disease was spread by living germs—bacteria and viruses. Because of his findings, other doctors learned to sterilize or boil their medical equipment to kill these unseen germs, and many lives were saved. Pasteur also discovered that by injecting a person with dead germs from a certain disease he could make that person immune to that disease.

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What is asthma?

MEDICINE

1. A respiratory disease
2. An eye disease
3. A chemical compound

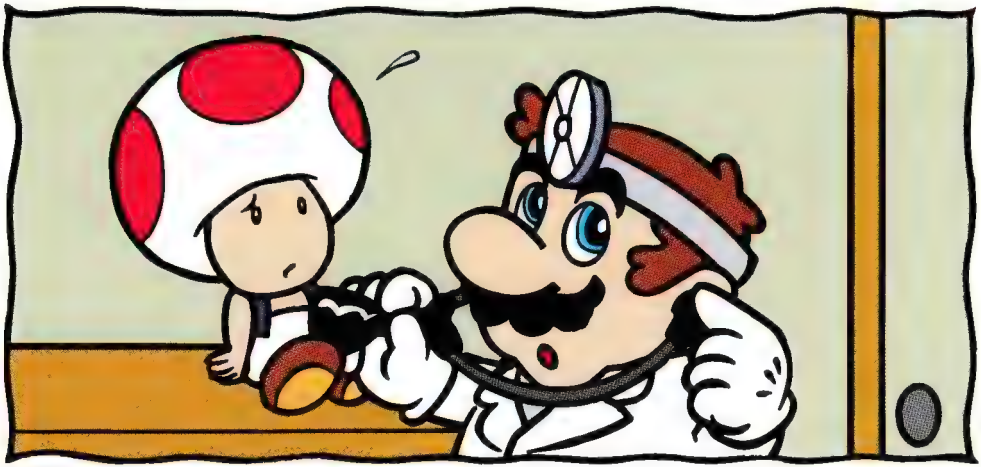

Illustration Gary Fields

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Asthma

Someone with asthma may suddenly begin to wheeze or gasp for air. The reason? Thick globs of mucus, called phlegm, are partially blocking the small bronchial tubes, or airways, in his or her lungs, making it difficult to breathe in or out.

1 Asthma is a respiratory disease that creates difficulty in breathing.

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A bronchodialator is sometimes prescribed to open congested bronchial tubes.

The most common type of asthma, allergic bronchial asthma, is caused by allergic reactions to things like dust, pollen, animal hair, dander, feathers, or certain foods. Asthma attacks may accompany heavy exercise, emotional stress, a nose or throat infection, or a sudden change of weather. Most asthmatics have periodic attacks throughout the year.

Treating Asthma

After a patient takes an allergy skin test, his or her doctor can identify things to which the patient is allergic. Then most doctors prescribe drugs—pills and inhalers called bronchodilators—to relax bronchial muscles and open the lung's airways. Some inhalers are used just twice a day, in the morning and evening. Others are carried by asthmatics for use as needed.

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What is an injury that breaks a bone called?

MEDICINE

1. Fracture
2. Fraktur
3. Frankfurter

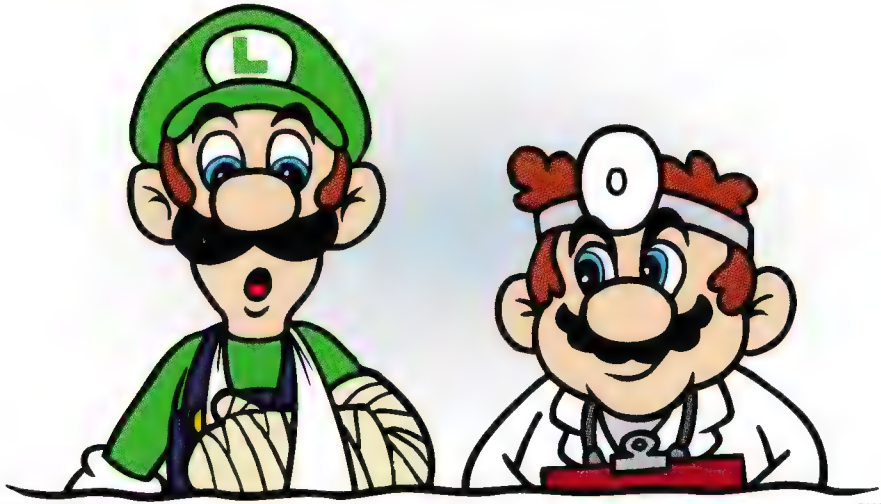

Illustration: Gary Fields

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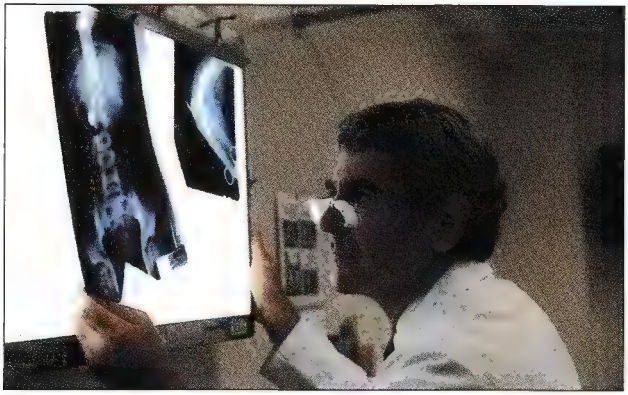
Fractures

Beneath your skin and muscle layer, your body is a mass of connected bones. Some injuries cause your bones to break, or fracture.

1 An injury that breaks a bone is called a fracture.



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Doctors frequently use x-rays to diagnose fractures.

Common causes of fractures are falls and collisions. Your bones are very strong, especially when you're young, but falling or twisting your bones can cause them to break. As people grow older their bones break more easily. That's why it's important to drink milk—to keep your bones healthy and strong!

Types of Fractures

Simple fractures occur below the skin. You can't see them. All you'll notice is swelling, tenderness and maybe a bruise. But moving a fractured part can be extremely painful. It's best to stay still and send someone for help. Compound fractures are more severe. This is when the bone breaks and pierces through the skin. Again, it's important to remain still and wait for help. A doctor tends a fracture by setting the bone—moving it gently back into place—and applying a cast over the injured area to protect it as it heals. In time—usually several weeks—the bone repairs itself and grows back together.

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What is a carbohydrate?

MEDICINE

1. Part of an automobile engine
2. A nutrient that provides energy
3. An infection of the skin

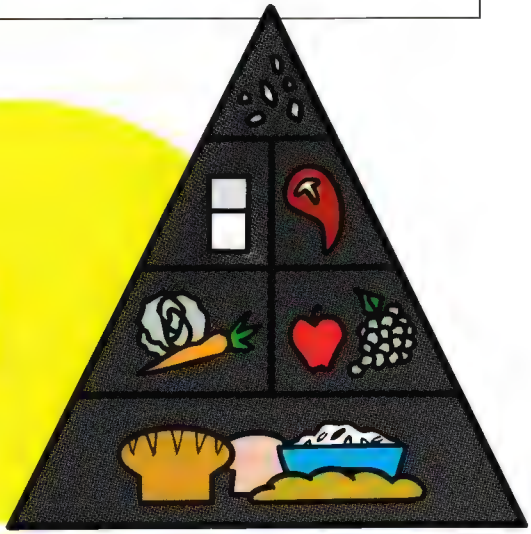

Illustration: Gary Fields

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Carbohydrates

Hidden in the word "carbohydrate" are the names of two elements that make up these nutrients—carbon and hydrogen. Carbohydrates also contain oxygen.

2 Carbohydrates are nutrients which your body uses for energy.

© Larry Lefever / Grant Heilman Photography, Inc.

The simple sugar your body needs for energy is contained in carbohydrates.

Your body needs three types of nutrients to function and stay healthy—fats, proteins and carbohydrates. Most of the foods you eat contain carbohydrates. Foods high in natural sugar, such as fruit, and foods high in starch, such as potatoes and pasta, are rich in carbohydrates.

Your Body's Fuel

Just like a machine, your body needs fuel to run. It gets this fuel from a simple sugar called glucose. All carbohydrates can be broken down by the body into glucose. Imagine a wall made of blocks. The wall is a carbohydrate. Each of the blocks is a molecule of glucose. The chemicals in your body work to break down the carbohydrate wall and isolate the glucose building blocks. Glucose gives you energy to move, run around, and play. It is also used by the body to build and repair body tissue to help you grow. Carbohydrates are best consumed as starches and natural sugars, which contain vitamins as well as the glucose your body needs.

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What is psychiatry?

MEDICINE

1. The study and treatment of foot diseases
2. The study and treatment of eye diseases
3. The study and treatment of mental illness

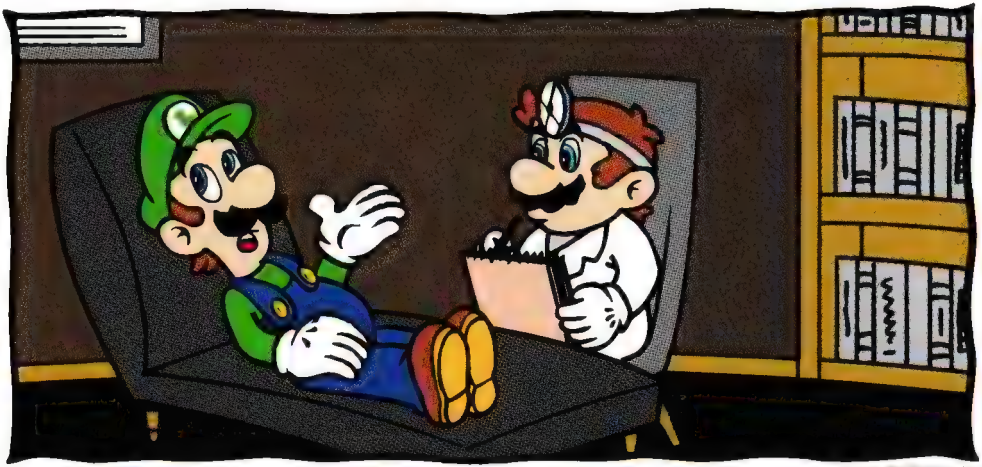

Illustration: Gary Fields

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Psychiatry

Modern psychiatry is the branch of medicine concerned with mental illness. The word psychiatry comes from the Greek word psyche, which means mind and iatreia, which means healing.

3 Psychiatry is the study and treatment of mental illness.

© David Harry Stewart / Tony Stone Images

People get help in group therapy by talking about their problems with others who understand how they feel.

Psychiatric disorders range from mild to severe. Schizophrenia is one such serious disease.

Treatments

Today, treatments for mental illness may include psychotherapy, group therapy, appropriate medication and/or vocational rehabilitation. In psychotherapy, psychiatrists help patients explore the underlying forces and past experiences that affect their behavior. Freud is referred to as the "father of modern psychiatry." It was Freud who first developed the systematic study of normal and abnormal behavior, which he termed psychoanalysis. In the past, mentally ill patients were often misunderstood, treated ineffectively—and sometimes cruelly. Today, while the causes of many psychiatric conditions remain a mystery, and treatments continue to be experimental, great strides toward prevention and cure have been achieved.

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Which are calcium-rich foods?

MEDICINE

1. Hamburger and potato chips
2. Milk and cheese
3. Corn and bacon

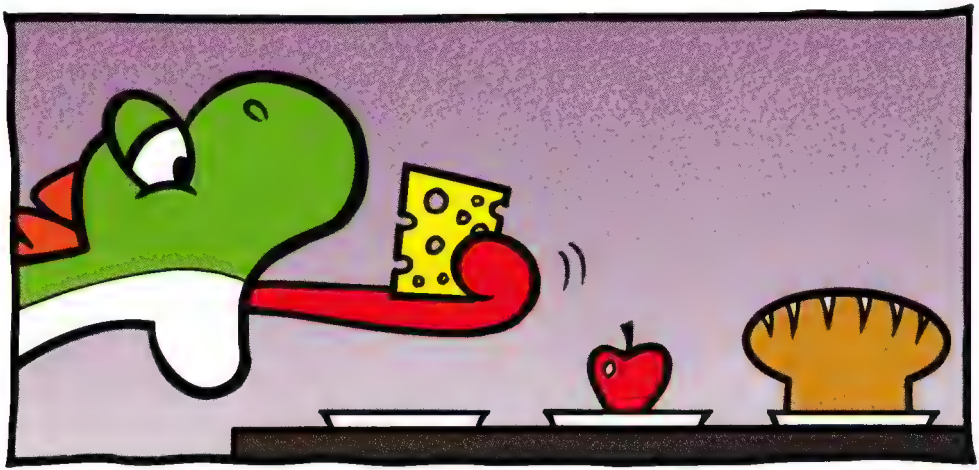

Illustration: Gary Fields

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Calcium

Calcium, a mineral found in rocks like chalk and limestone, makes up about 3 percent of Earth's crust. It's also essential for all living things, including humans.

2 Milk, cheese, and other dairy products are high in calcium.

© Steinlen / Sipa Press

Calcium helps in the growth of teeth and bones. That's why it's an important part of a baby's diet.

Minerals, from food sources or supplements, are necessary for a body to maintain its functions. You need calcium for growth, maintenance of teeth and bones, to help blood clot, and to make muscles contract.

Getting Calcium

Nutritionists say a daily diet that includes several servings of milk, milk products, or green vegetables like spinach and broccoli, supplies enough calcium for your body's normal needs. But babies, expectant mothers, and older people need extra calcium. Babies drink a lot of milk to help their teeth and bones grow. Before a baby is born, its mother may take calcium supplements to help the baby's bones develop. And as people grow older, their bones often become weaker. Taking extra calcium may keep their bones strong and healthy.

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Which is a protein-rich food?

MEDICINE

1. Gelatin
2. Fish
3. Water

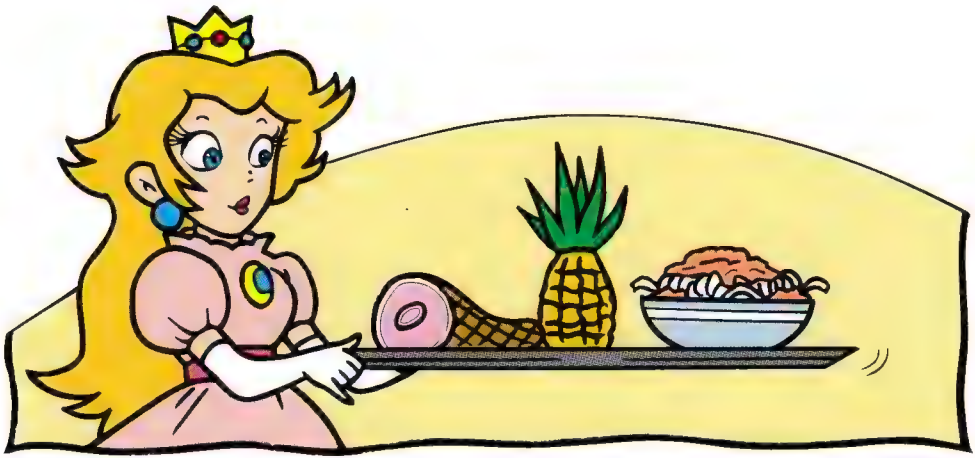

Illustration Gary Fields

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Protein

Protein, a basic nutrient, is essential for growth in plants and animals. Plants make protein from materials in air and soil. Animals, including humans, can't produce protein, they get it from foods like fish, cheese, and milk.

2 Fish is a high-protein food.

© E.Valentin / Hoa Qui

People who don't get enough protein from high-protein foods like fish, lack energy and lower their resistance to disease.

Your body needs protein to build, repair, and maintain body tissue. But protein can't enter your body directly from food. It must be broken down, during digestion into amino acids, which are then absorbed by the body. Your body produces some amino acids, like the keratin in nails and hair, but all essential amino acids must be supplied by foods.

Good Sources

Eggs, cheese, fish, meat, and milk are complete proteins, or contain all essential amino acids. Vegetables, nuts, cereal grains, and legumes are good sources, but are incomplete proteins that lack one or more essential amino acids. By eating two incomplete proteins together, such as peas mixed with rice, you can get complete proteins.

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Why is it important to exercise?

MEDICINE

1. You'll be able to be as tall as you want.
2. Everyone is doing it.
3. It's good for your heart.

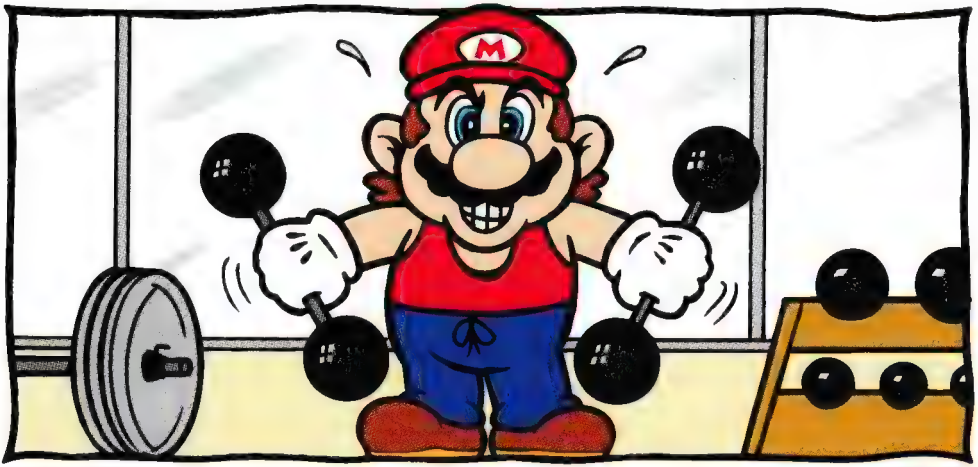

Illustration Gary Fields

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Exercise

Exercise is important for good health. It gives your muscles a workout and is especially good for your heart—the most important muscle in your body.

3 Exercise is good for your heart.

© X. Richer / Hoa Qui

It's best to exercise with other people as a safety precaution.

The body is like a "well oiled machine" that needs to be used in order to work. The best way to "oil it" is to exercise—from a walk around the block to a workout.

Know What You Can Do

Walking is good exercise. So is riding a bike, swimming, or doing jumping jacks. As you exercise, your heart rate increases and pumps oxygen-rich blood throughout your body. Most kids can safely enjoy working out. Benefits from regular exercise include increased coordination, strength and endurance. But no exercise should be painful. You may feel some muscle ache after strenuous exercise, but if you have pain while you exercise, stop immediately. And exercise with a buddy so if you do have a problem, the other person can go for help. Warm up before and cool down after exercising by stretching and breathing deeply. Start out slowly, then add more when you're ready, but stop before you get too tired. And drink plenty of water during and after exercise to replace lost fluids.

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What is a calorie?

MEDICINE

1. A cookie
2. A unit of heat energy
3. An insect

Illustration Gary Fields

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Calorie

A calorie is a unit of heat energy. One calorie is equal to the amount of heat it takes to raise the temperature of 1 gram of liquid water from 58.1°F to 59.9°F (14.5°C to 15.5°C).

2 A calorie is a unit of energy.

© L. Maquet

Children and athletes need more calories than most adults because they burn up their fuel quickly.

Calories measure the amount of energy provided to our bodies by the food we eat. The calories are our fuel. Energy produced by this fuel makes it possible for our bodies to function.

We all need to consume a certain amount of calories a day to function. How many calories depends on our size and what kind of work we do or how hard we play. Small thin people who are not very active need fewer calories than large active people. Professional athletes will consume and burn off more calories than people who sit at desks all day.

The fuel we don't use is stored as fat. Consuming too many calories causes people to store too much fat which makes them overweight and unhealthy. One way to stay healthy is to consume the right amount of calories to suit your age, weight, and activity level.

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Why is too much salt bad for you?

MEDICINE

1. It makes you gain weight
2. It makes you lose weight
3. It can cause hypertension

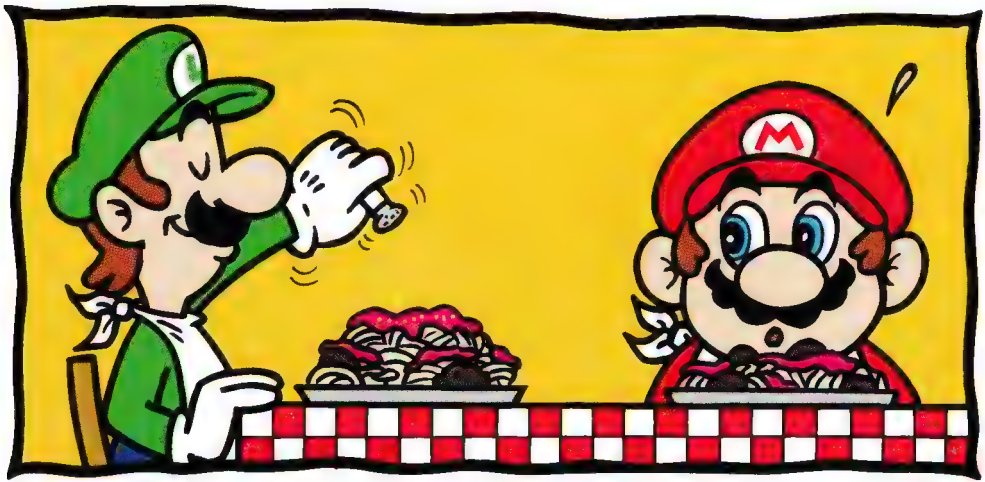

Illustration: Gary Fields

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Salt

Sodium chloride, the chemical name for salt, is the nutrient found in most foods. Salt is an essential part of our diet but in large quantities it can be harmful.

3 **Too much salt can cause hypertension, or high blood pressure.**

© Len Sirman

Table salt is harvested from sea water or mined in salt mines.

All food contains water in varying proportions along with organic substances, vitamins, and mineral salts. Some mineral salts, such as calcium, potassium, and sodium chloride are abundant in certain foods.

An Indispensable Element

If you taste your tears, you'll find that they are salty. The same goes for all the liquids produced by your body, which is why you need to keep replenishing your salt supply in proper amounts.

We get thirsty when there is a change in the amount of salt in our blood. When there is more salt than water in our system, thirst results. Extremely high levels of salt can cause a condition called edema—too much fluid surrounding the body's cells. Excess salt can cause high blood pressure, or hypertension.

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What is acupuncture?

MEDICINE

1. A martial art
2. Medical therapy
3. What causes a flat tire

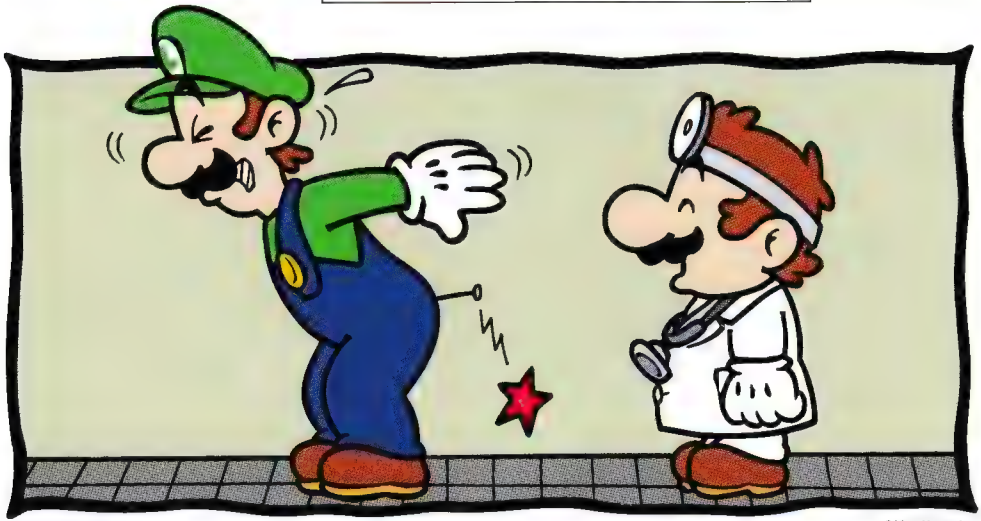

Illustration: Gary Fields

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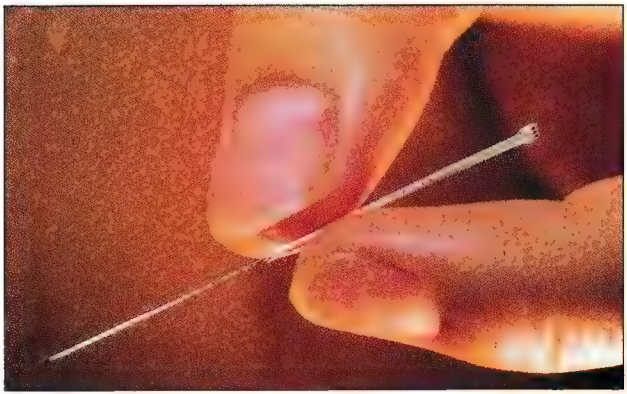
Acupuncture

Acupuncture is thought to have been invented by the Chinese thousands of years ago. Today it is considered a form of alternative medicine by many western cultures.

2 Acupuncture is a form of medical therapy.



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This is a close-up photograph of an acupuncture needle prior to insertion.

The ancient Chinese believed that the life energy in a healthy person's body flows freely and smoothly. An unhealthy person has obstacles blocking the flow of life energy. These blockages can be broken up through the use of thin, solid acupuncture needles on specific points of the body. It is believed that by doing this, energy flow can be improved, thereby improving the patient's well-being.

Modern Acupuncture

Today acupuncture is used to control surgical pain, allowing patients to remain awake during surgery. Acupuncture is frequently used for temporary pain relief for complaints such as backaches and headaches.

Although the exact mechanisms involved in the success of this procedure are unknown, it is believed that the needles interrupt the nerve impulses which send pain signals to the brain.

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Which foods have vitamins?

MEDICINE

1. Animal and plant foods have vitamins.
2. Only uncooked vegetables and fruits have vitamins.
3. Only foods with additives have vitamins.

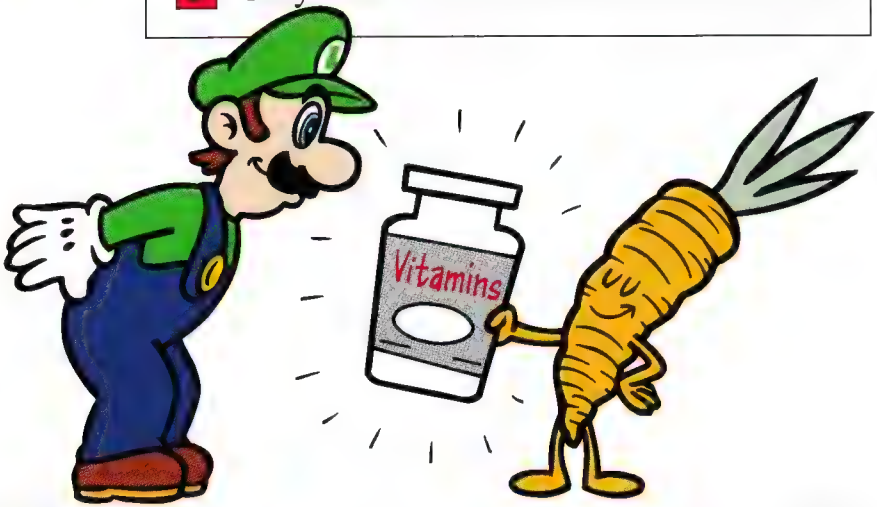

Illustration: Gary Fields

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Vitamins

Vitamins are essential to good nutrition. They help our bodies function properly and fight diseases.

1 Animal and plant foods have vitamins.

© Darque Jernican

It is the A, B complex, C, and D vitamins which are essential, but there are many others which are considered beneficial as well.

What are some of the vitamins we need each day? You can get an idea by looking on your cereal box (or on just about any box of food). The primary vitamins your body needs are vitamins A, C, D, and the B complex vitamins thiamin (B12), riboflavin (B2), pyridoxine (B6), and vitamin B12. Other vitamins include E, G, H and K.

Feed Your Body

You need vitamins for proper metabolism. Metabolism refers to everything your body does internally to create energy—the chemical reactions that occur in your cells. If you eat a balanced diet, your vitamin intake should be adequate. Vitamin A, found in yellow vegetables like carrots, helps keep your eyes healthy. Vitamin B, found in liver and some grains, is good for the blood. Vitamin C, found in citrus fruits, helps fight disease. We get vitamin D from dairy products but sunlight also activates Vitamin D in our skin. Vitamin D helps build strong bones.

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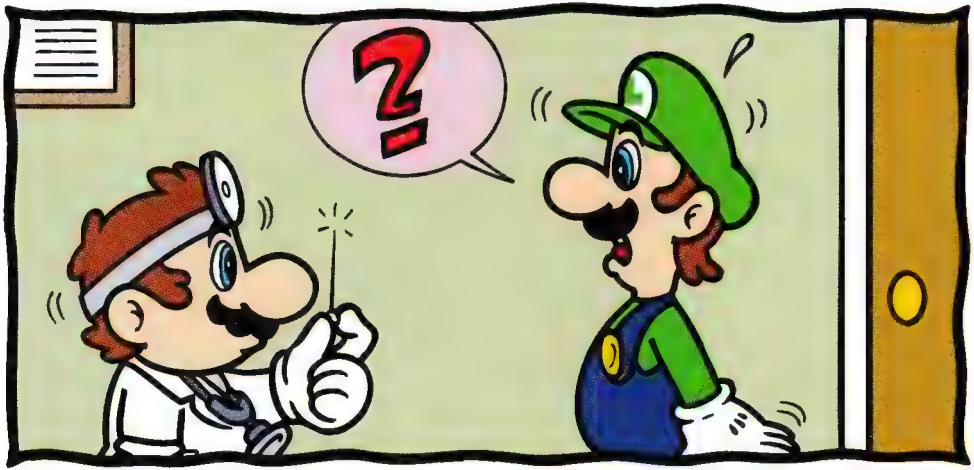
What are acupuncture needles made of?

MEDICINE

1. Plastic
2. Wood
3. Stainless steel



Illustration, Gary Fredas

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Acupuncture Needles

Acupuncture needles are very thin, not much thicker than a human hair.

3 Acupuncture needles are usually made of stainless steel.

© Len Sirman

Acupuncture needles are sterilized before every insertion to ensure that they do not carry infection.

Acupuncture needles are solid, not hollow like the ones used for giving injections. Few people feel pain when an acupuncture needle is inserted just under the skin. Little or no bleeding occurs when the needles are inserted.The strongest sensation reported is an ache or a quick sharp jolt, but nothing compared to the sensation caused by an injection needle. Most patients feel a numbness or nothing at all once the needle has reached its target point.

The Treatment

Acupuncture needles are usually 1 to 1 1/2 inches (2.5-3.75 cm) long. Longer ones are used for special treatments. The needles are inserted anywhere from 1/4 inch to 2 inches (.63-5 cm) under the skin, depending on the amount of fat on the patient.

Although today acupuncture needles are manufactured all over the world, most acupuncturists prefer to use handmade Chinese needles.

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What is diabetes?

MEDICINE

1. The distance around a sphere
2. A phase in the aging process
3. A metabolic disorder

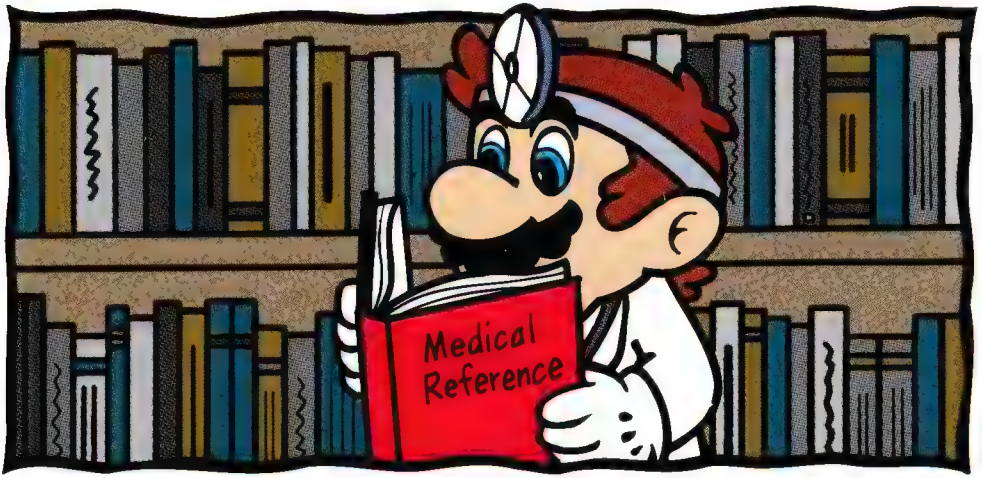

Illustration: Gary Fields

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Diabetes

Diabetics, people who suffer from diabetes, are unable to metabolize, or process, the sugars they eat. As a result, they have rapidly changing blood sugar levels.

3 Diabetes is a metabolic disorder resulting from an excess of insulin in the blood.

© Len Sirman

Diabetics must avoid foods high in sugar, such as sweets and many kinds of raw fruit.

Insulin is a hormone produced in the pancreas that regulates the level of sugar in the blood. Diabetics either lack insulin, or lack the ability to use the insulin their bodies produce.

There are two types of diabetes. People with Type I, or insulin-dependent, diabetes must take insulin by injection because their pancreas doesn't produce it. Most cases of Type I diabetes start at birth.

People with Type II, or non-insulin-dependent, diabetes cannot use the insulin present in their blood. Most cases of Type II diabetes start during the adult years and can be controlled by changes in diet.

Diabetes Care

Before insulin was isolated in the 1920s, diabetes was a fatal disease. Today, treatment of diabetes is highly successful, either through regular injections or monitoring diet and exercise.

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What causes altitude sickness?

MEDICINE

1. Low oxygen level of the air
2. High air pressure
3. Lack of ozone in the air

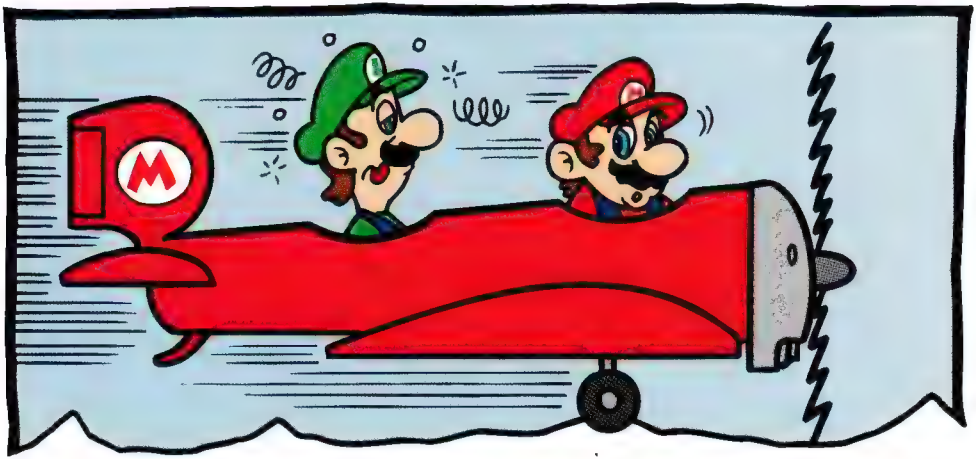

Illustration: Gary Fields

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Altitude Sickness

Pilots, explorers, and mountain dwellers can all fall victim to altitude sickness, a sometimes-fatal condition caused by the drop in oxygen and air pressure at over 8,000 feet (243.8 m) above sea level.

1 Altitude sickness is believed to be caused by the low oxygen levels and low pressure of air at high altitudes.

© Mario Colonel / Explorer

Mountain climbers train to prepare for high-altitude conditions before setting out on expeditions.

Symptoms of altitude sickness include breathlessness, racing heartbeat, giddiness, headache, swelling of the legs and feet, stomach upset, and weakness. The more serious type of altitude sickness, pulmonary edema, causes fluid to build up in the lungs, which prevents the intake of oxygen. These symptoms can all be reversed when the victims are evacuated to a lower altitude.

Preventive Training

Mountain climbers who go on high-altitude expeditions must adapt to lower and lower oxygen levels as they approach the peaks. Their bodies adapt during the gradual climbs. But recent advances in transportation to high places mean that greater numbers of people can reach summits very quickly. The more they learn about what to expect at high altitudes, the better prepared they will be to cope.

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What is plague?

MEDICINE

1. An epidemic disease
2. A card game
3. Another name for thunder

Illustration: Gary Fields

©1996 Nintendo

Plague

Plague is a highly contagious, deadly disease which has killed great numbers of people throughout history. The first record of an outbreak of plague is in the Old Testament of the Bible.

1 **Plague is an epidemic, or widespread, disease that people catch from the fleas of infected rats and other rodents.**

© Édimédia

One of the worst outbreaks of plague occurred in the 14th century. One-fourth of the population of Europe, or 25 million people, died between 1346 and 1353.

Plague is caused by an organism called Yersinia pestis. Bubonic plague, the most common kind, brings on swelling in the lymph nodes of the groin and armpits; pneumonic plague causes the lungs to fill with fluid; and septicemic plague, which affects the blood, results in brain damage.

Black Death

In medieval times, bubonic plague wiped out one-fourth of the people in Europe. The disease became known as the Black Death because victims were afflicted with black spots on their skin. One reason the plague became so widespread was that people often lived in unsanitary conditions surrounded by garbage and other waste. These conditions attracted rats, which carried the disease from village to village.

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What are mumps?

MEDICINE

1. A disease that causes the neck and cheeks to swell
2. Baby geese
3. Round decorative pillows

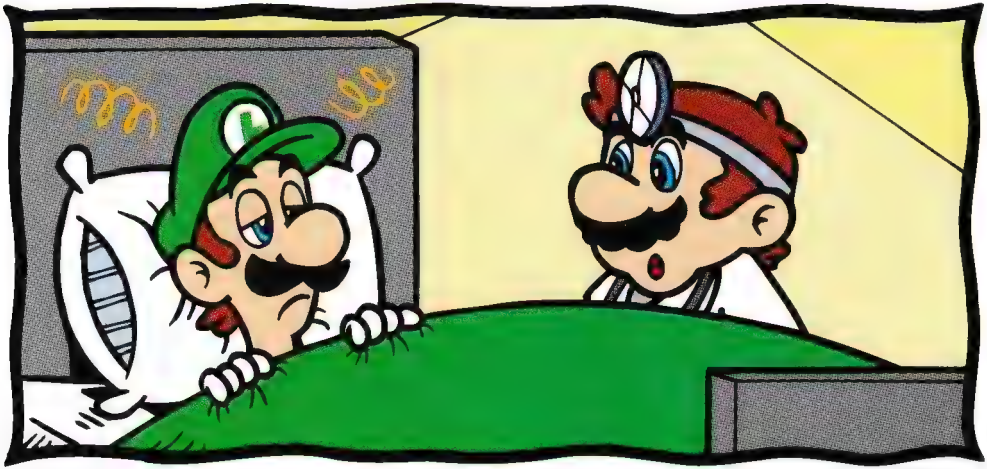

Illustration: Gary Fields

©1996 Nintendo

Mumps

Typical symptoms are a mild fever, soon followed by swelling of the area in front of the ear, which rapidly spreads to the neck and under the jaw.

1 **Mumps is a contagious disease that causes the salivary glands in the neck to swell.**

© S. Missir / Explorer

Having the mumps is not painful, but it does make chewing and swallowing difficult. Typically the swelling goes away after 4 or 5 days.

The mumps, also called Epidemic Parotitis, is easily spread from person to person and commonly affects young people between the ages of 5 and 15. About 17-21 days after coming in contact with the mumps, the symptoms begin to develop. Occasionally an adult will contract the mumps and there will be additional swelling in other parts of the body, but it does not last very long and generally there are no lasting complications.

Treatment

There is no special treatment for the mumps, and people usually only contract the mumps once during their entire lifetime, becoming immune to the virus during the first episode. There is a preventive vaccine made from a weakened live mumps virus, which is often given to children after their first birthday in combination with the measles and rubella vaccines.

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What are pharmaceuticals?

MEDICINE

1. Apprentices to pharmacists
2. Substances with medicinal qualities
3. Agricultural workers

Illustration: Gary Fields

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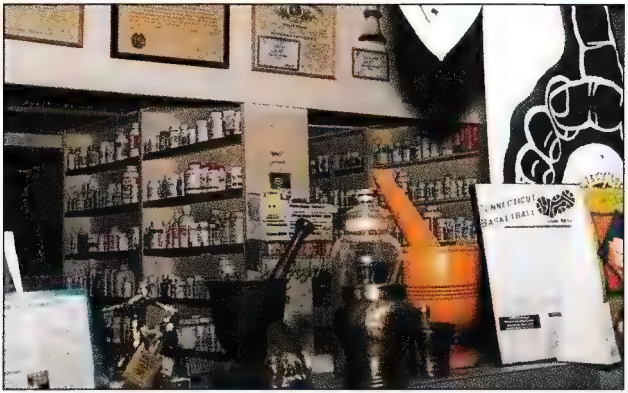
Pharmaceuticals

Pharmaceuticals are substances used in the diagnosis, treatment, or prevention of disease, and for restoring, correcting, or modifying bodily functions.

2 Pharmaceuticals are substances used for their medicinal qualities.



© Nathan Olshin

Some drugs are sold over the counter for relief of minor ailments, but stronger drugs may only be prescribed by a doctor.

Records of the use of medicinal plants and minerals date back to ancient Chinese, Hindu, and Mediterranean civilizations. During the 1500s, pharmaceutical practice began to develop rapidly in Western civilization, and in 1546 the first list of drugs and their preparation, called a *pharmacopoeia*, appeared in Germany. Pharmacy is considered to have begun as a profession in 1617 when the Society of Apothecaries was founded in London.

Classifying Pharmaceuticals

Pharmaceuticals may be classified by their chemical group, by the effect they have on the body, and by the illnesses they are used to treat. Some of the first substances used for their medicinal qualities were anesthetics or painkillers such as morphine and chloroform. Pure pharmaceuticals may be derived naturally from plants or animals.

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Which food is a lipid?

MEDICINE

1. Lettuce
2. Oatmeal
3. Butter

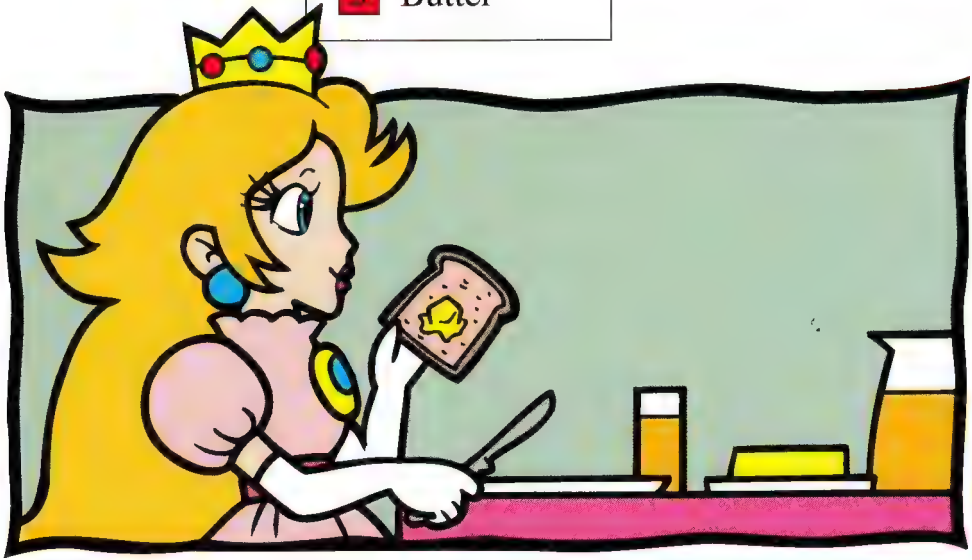

Illustration Gary Fields

©1996 Nintendo

Lipids

You need a certain amount of fat in your diet for your body to stay healthy. Fatty substances, called lipids, are found in vegetable oils, meats, and dairy products.

3 Butter is a lipid, or food containing fat.

© Gaillard / Jerrican

Oil, butter, milk, and margarine contain dietary fat.

Your body digests lipids and deposits them into fat layers just below the skin. These layers cushion the internal organs and can be transformed into energy. Fat is also involved in blood clotting and hormonal responses.

Since fat is found in so many foods, it is easy to eat enough for the body to function. In fact, people often consume too much fat. This can lead to obesity and heart problems.

American Diet

Studies in the U.S. have shown that the average person derives as much as 50 percent of his or her caloric intake from fat. Other studies have shown that the risk of heart attack decreases when less fat is consumed. This is why, to reduce heart disease, many adults follow a low fat diet.

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What are medicines made of?

MEDICINE

1. Plants and animals only
2. Minerals only
3. Plants, animals, minerals, and bacteria cultures

Illustration: Gary Fields

©1996 Nintendo

Medicines

People have been aware of the medicinal qualities of plants for centuries. The first pharmacies were opened in Baghdad (now in Iraq) during the 9th century A.D.

Medicines are derived from plants, animals, minerals, and bacteria cultures.

© Len Sirman

Today medicine may be available in several different forms, such as a syrup, tablet, and cream.

Primitive humans discovered that certain fruits, leaves, and tree barks could be used to heal wounds and ease sickness. In ancient civilizations, medicine men, witch doctors, wise women, and shamans prescribed and administered medicines. Through trial and error, they were able to find treatments for many illnesses and afflictions and passed recipes for medicinal potions from generation to generation.

Modern Medicines

Some of these recipes are still used today. For example, the juice from aloe leaves is commonly used to treat burns and dry skin. Extracts from echinacea and goldenseal plants are used to ease a sore throat and cough.

Modern doctors have begun to understand that some of the ancient potions contained chemicals, or drugs, that could be extracted from plants or made synthetically in a laboratory.

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What is the main purpose of sunscreen?

MEDICINE

1. To protect the skin from harmful radiation
2. To help the skin tan more darkly
3. To keep the skin moisturized

Illustration. Gary Fields

©1996 Nintendo

Sunscreen

Overexposure to the Sun's ultraviolet rays can lead to painful burns and fatal skin cancers. The chemicals in sunscreen prevent ultraviolet rays from contacting the skin.

1 **The main purpose of sunscreen is to protect the skin from the Sun's harmful radiation.**

© Len Sirman

People who have had one or more severe sunburn during childhood are more prone to some types of skin cancer later in life. Everyone, young and old, can benefit from using sunscreen.

Your skin is your body's largest organ. It protects your body's deeper tissues from physical, chemical, and bacterial agents and is a key element of your sense of touch. Your skin also helps maintain your body's temperature, through the activity of sweat glands and blood vessels.

Skin is elastic, that is, it can stretch. It varies in thickness on different parts of the body: The eyelids are 0.02 inches (0.5 mm) thick, while the skin on the palms of your hands and the soles of your feet is up to 0.17 inches (4 mm) thick.

Skin Cancer

Cancer is the abnormal growth of cells. Skin cancer is one of the most common forms of cancers in humans. The best way to prevent skin cancer is to wear sunscreen and avoid prolonged exposure to the Sun.

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What is normal body temperature?

MEDICINE

1. 68°F (20°C)
2. 98.6°F (37°C)
3. 212°F (100°C)

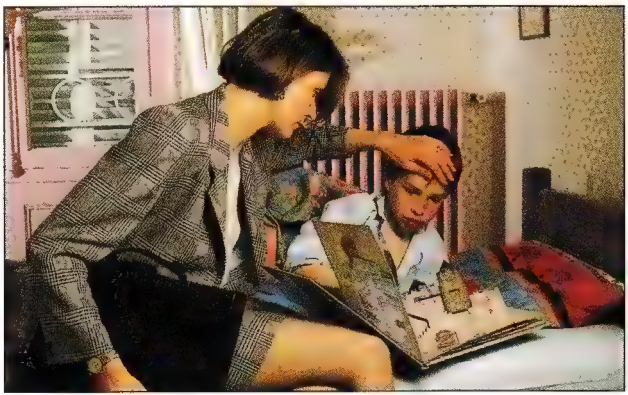
Illustration Gary Fields

©1996 Nintendo

Body Temperature

When your body temperature measures 5° to 9°F (3° to 5°C) above normal, you have a fever. Fevers often accompany a specific illness and help the body fight off infection.

Normal body temperature is 98.6°F (37°C).



© Gaillard / Jerrican

When you have a fever, it helps to rest and drink lots of fluids to prevent your body from becoming dehydrated.

Besides a rise in body temperature, symptoms of a fever include headache and an increase in pulse and breathing rate.

Stages of a Fever

Fevers generally pass through three stages. First, a person may get a headache and lose his or her appetite. He or she may also feel cold and have pale skin, due to decreased blood circulation. About half an hour later, the second stage begins. Body temperature peaks, and the skin appears flushed and feels hot. During the third stage, the fever slowly dissipates. As the body's temperature returns to normal, a person may perspire a lot.

A continued fever is one that persists for several days with only slight fluctuations. Fevers that fluctuate significantly in temperature are called remittent fevers. With an intermittent fever, body temperature alternately drops to normal and rises back to above normal.

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Why are children vaccinated?

MEDICINE

1. To prevent them from contracting certain diseases
2. To help them grow faster
3. To determine how healthy they are

Illustration: Gary Fields

©1996 Nintendo

Vaccine

When you were born, you received a series of shots, or vaccines, to protect you from getting certain diseases later in life. Some of these diseases are whooping cough, measles, and diphtheria.

1 **Children are vaccinated to prevent them from contracting certain diseases.**

© Rouillot / Jerrican

Over half the children in the world receive vaccines against whooping cough, tetanus, measles, diphtheria, polio, and tuberculosis. The more children that are vaccinated, the better the chances of eventually eradicating these diseases.

Biologists use bacteria and viruses grown in a laboratory in creating vaccines to fight many diseases.

How Vaccines Work

The substances in a vaccine stimulate your body to produce more lymphocytes, or defender cells. Some lymphocytes make proteins called antibodies to neutralize the germ, while others attack and destroy the germ or the cells infected by it. After conquering the infection, memory lymphocytes remain in the body for weeks, months, or even years. When they are present, the body can respond even more quickly and effectively if the germ ever enters the body again.

Thanks to vaccines, the occurrence of some diseases has been greatly diminished. A vaccine for smallpox completely eradicated the disease.

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How is a person or animal infected with rabies?

MEDICINE

1. By being bitten by a rabid animal
2. From eating spoiled food
3. From being out in the cold too long

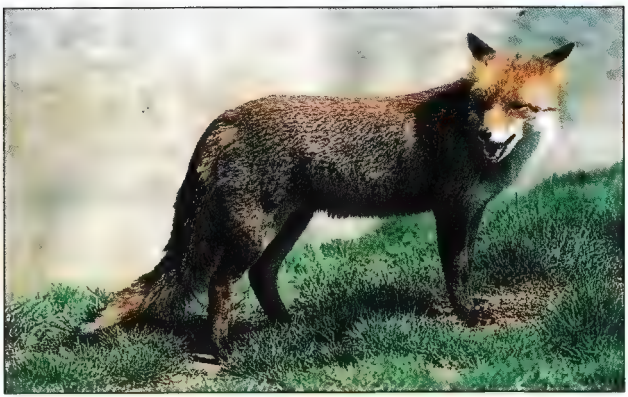
Illustration Gary Fields

©1996 Nintendo

Rabies

The rabies virus is transmitted through the saliva of a rabid animal. Rabies symptoms appear after a 10-day to 6-month incubation period.

Rabies is passed through the bite of an infected, or rabid, animal.



© G. Lacz / Sunset

In North America, the animals most commonly affected with rabies are foxes, skunks, raccoons, bats, cats, and dogs.

Rabies can affect any warm-blooded animal. The disease attacks the brain and central nervous system. An infected animal may first show sudden changes in behavior. For example, a normally outgoing cat may start to hide all the time. In cats, this stage lasts about a day. During the next stage, the animal becomes aggressive and exhibits muscular twitching, a hoarse voice, and excessive salivation. The next stage, paralysis, lasts one to four days before death.

Prevention

Required rabies vaccinations for pets has cut down the spread of rabies. However, because of the large number of strays, the disease is still a danger for unvaccinated companion animals and for humans. While rabies in humans is treatable if caught early, in animals it is fatal.

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What is Braille?

MEDICINE

1. Middle Eastern bread
2. A system of writing for the blind
3. Another name for a chain-link fence

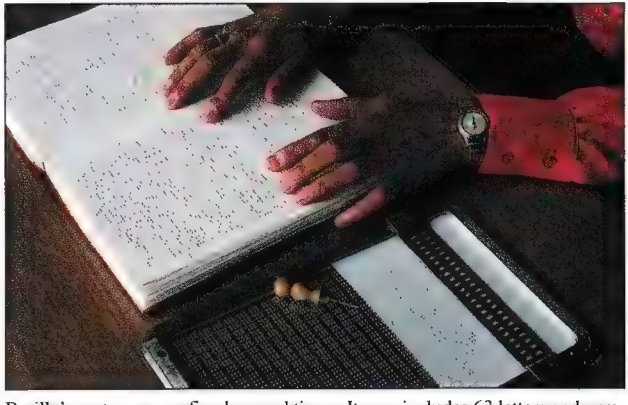
Illustration Gary Fields

©1996 Nintendo

Braille

Even though blind people can't see, they can read using a system of writing called Braille.

Braille is a system of writing for the blind.



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Braille's system was refined several times. It now includes 63 letters and symbols. There are also Braille systems for musical notation, science, and math.

Louis Braille (1809-1852), a French teacher, was blinded in an accident when he was three years old. At a school for blind children in Paris, France, he was taught to read by using his fingers to feel individual letters engraved in blocks of wood. It was hard to learn, and almost impossible for a blind person to write using this technique. Braille wanted to simplify the system.

Idea from the Army

At the time, French army officer, Charles Barbier developed a code that could be read by soldiers in battle at night. This was before soldiers carried radios to communicate. And reading a note by flashlight or lighted match could reveal the soldier's position to the enemy. So, Barbier formed coded letters by punching dots in a piece of cardboard. A soldier read the message by feeling the raised dots.

Braille used this idea in 1824 when he created his own raised dot alphabet. Because the letters were formed by punching dots on a grid they could be written by blind people as well. He was only 15 years old!

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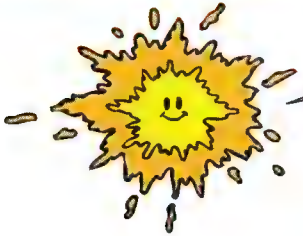
How many types of hearing impairment are there?

MEDICINE



1 One

2 Two

3 Three

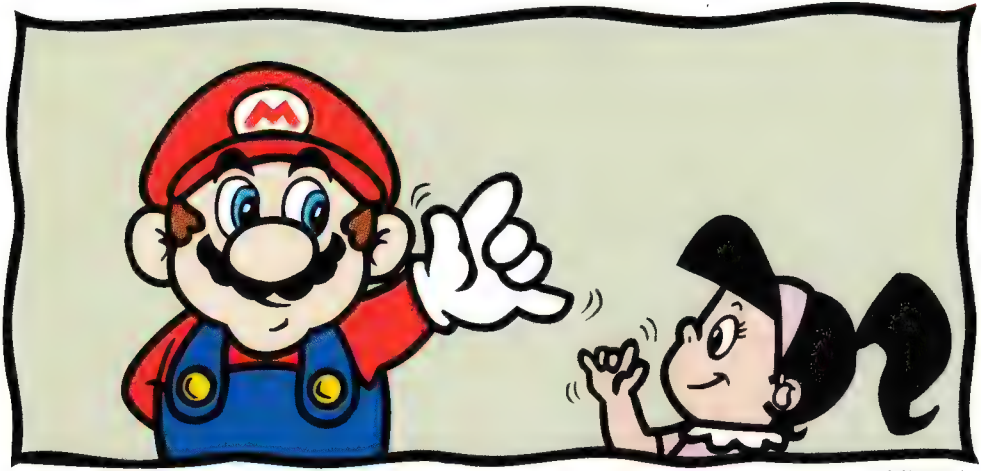


Illustration Gary Fields

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Deafness

Hearing loss may be the result of birth defects, illness, or exposure to loud noises.

2 **Hearing impairment, or deafness, generally falls into two categories: nerve deafness and conduction deafness.**

© Len Sirman

Hearing aids help some hearing impaired people by amplifying sound impulses so they can travel to the brain. Some hearing aids can bypass the damaged part of the ear and send impulses directly to the skull.

Your ear is like a pathway made up of three sections—outer, middle, and inner. When you hear, sound travels from the outer ear (the part on the side of your head) through the middle ear to the inner ear. Then sound impulses travel to your brain which translates them. In people who are hearing impaired, some part of this pathway is blocked or damaged.

In conduction deafness, the pathway is blocked—by a bone or other type of growth—so sound can't get through. In nerve deafness, the nerves that carry sound impulses from the ear to the brain are damaged so the sound impulses don't reach the brain.

Hearing Help

Sometimes hearing loss can be corrected by surgery to remove a blockage. Hearing aids can help people with nerve deafness.

American Sign Language (ASL) helps hearing impaired people communicate and converse. This system of hand signals includes an alphabet and hundreds of signs for words and phrases.

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What is the study of diseases?

MEDICINE

1. Sickology
2. Pathology
3. Botany

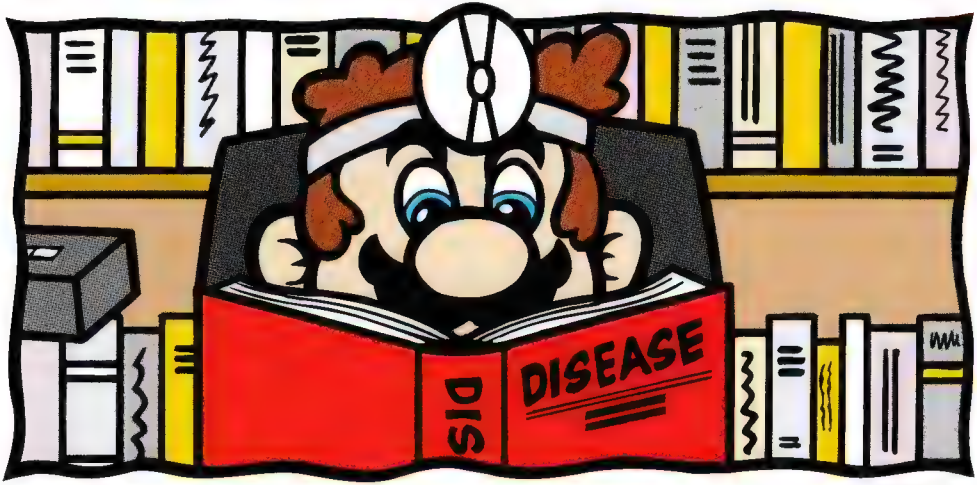

Illustration Gary Fields

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Pathology

Some doctors treat diseases, others study them. A pathologist is a doctor who studies how diseases live and grow, and how they can be cured.

Pathology is the study of diseases.

© Len Sirman

The word pathology comes from the Greek word *pathos,* meaning suffering. A pathologist studies the "path" of a disease.

From cancer to the common cold, every disease has a cause. Some are caused by germs or viruses. Others are hereditary—passed from one generation of family to the next. Once a disease occurs, it tends to follow a specific path or progression. The flu, for example, might start with a headache or scratchy throat, followed by a fever and a stuffy nose. A pathologist finds the cause and charts the progression of a disease. This information helps medical researchers find cures and treatments for diseases.

Lab Work

Most of a pathologist's work is done in a research laboratory, where she examines samples of body tissue and fluids from patients suffering from diseases. This examination also shows how medication given to the patient affected the disease. Some pathologists, known as forensic pathologists, specialize in determining cause of death. They usually work in hospitals, with police, or in a municipal medical examiner's office.

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Which is a contagious disease?

MEDICINE

1. Cancer
2. Migraine
3. Cholera

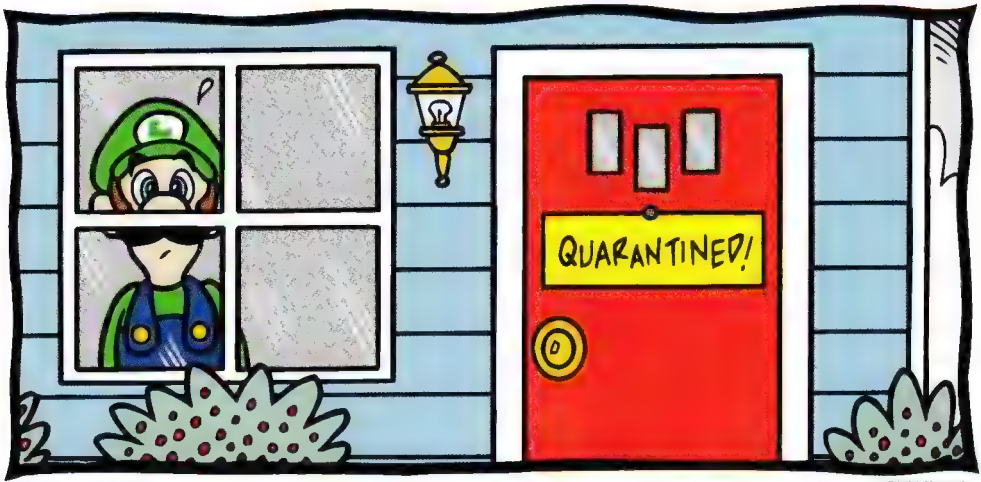

Illustration: Gary Fields

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Contagious Diseases

A contagious disease is easily passed from person to person or by organisms that carry disease. Malaria is carried by mosquitoes; typhoid fever by contaminated water.

3 Cholera is a contagious disease.

© Goldner / Sipa Icono

Epidemics of contagious diseases were common in the Middle Ages, when medicine was primitive and sanitation was poor. Diseases such as cholera and bubonic plague killed thousands of people in medieval Europe.

Large-scale outbreaks of contagious diseases are called epidemics. They can be difficult to control because the disease may spread too fast for doctors to catch it in early stages.

Polio Vaccine

Poliomyelitis—polio for short—is a contagious disease that affects the spinal cord. People who contract polio may lose the use of their arms or legs. At one time, this disease was extremely common in the U.S. Even president Franklin D. Roosevelt contracted polio and was confined to wheelchair for most of his adult life. But one of the worst aspects of the disease was that it usually struck children. By studying the disease, Dr. Jonas Salk, an American microbiologist, developed a polio vaccine in 1955. Today, all children can be immunized against polio, and the disease is less common.

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What disease is transmitted to humans by parrots?

MEDICINE

1. Green Feather Fever
2. Malaria
3. Psittacosis

Illustration: Gary Fields

©1996 Nintendo

Psittacosis

Sometimes called parrot fever, psittacosis is caused by microscopic parasites passed from parrots or parakeets to humans.

3 Psittacosis is a disease parrots can transmit to humans.

© Len Sirman

Lots of people keep caged birds as pets, but some birds, such as parrots and parakeets, can transmit diseases to humans.

Psittacosis is not a common disease, but it sometimes affects people who keep birds as pets. The birds can carry tiny infectious microorganisms on their feathers, under the scales on their feet, or under their claws. Its symptoms are similar to the flu—headache, fever, nausea, and sometimes nosebleeds.

Greek Words

The name psittacosis comes from the Greek word *psittakos,* meaning parrot. The disease usually affects birds. It's one of a group of diseases known as ornithosis, from the Greek word *ornithos,* meaning bird.

Fighting the Fever

To treat the disease, doctors usually prescribe antibiotics such as penicillin, erythromycin, or tetracycline. These common medications help to bring down the fever and destroy the parasite that caused it.

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Which is another name for hypnosis?

MEDICINE

1. Asphyxiation
2. Mesmerism
3. Somnambulism

Illustration: Gary Fields

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Hypnosis

Mesmerism was named for Franz Mesmer of Vienna, who introduced the technique of hypnosis in the late 1700s.

2 Hypnosis was once known as mesmerism.

© National Guild of Hypnotists, Inc., Merrimack, NH 03054

Hypnotherapist Dr. Dwight Damon works with a client.

Mesmer was more showman than medical man. He claimed to have supernatural powers which he used to put subjects into a trance. This, he said, cured disease. Physicians thought Mesmer was a phony, but some saw value in inducing a relaxed, trancelike state. They continued research and renamed the technique hypnosis, after Hypnos, the Greek god of sleep.

Call It Sleep

Hypnosis actually isn't a form of sleep. It's intense concentration—so intense that the subject is able to block out all distractions. This helps a person achieve a state of complete relaxation. A hypnotized person may become so relaxed he doesn't even feel pain!

Medical Uses

Before the invention of anesthetics, surgeons sometimes used hypnosis to relax patients for surgery. Today, dentists and physicians use hypnosis as an anesthetic or to relieve anxiety. Hypnotherapists use it to enhance memory, help patients overcome fears, or alter behavior.

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What is caffeine?

MEDICINE

1. A substance used in cosmetics
2. Fuel derived from plants
3. A natural stimulant

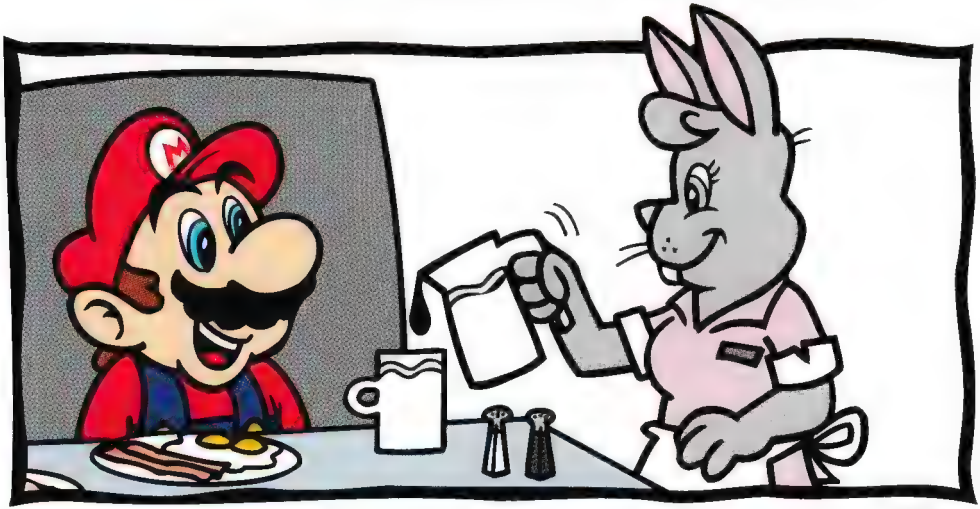

Illustration: Gary Fields

©1996 Nintendo

Caffeine

You probably know that coffee contains caffeine, but did you know tea, cola, and cocoa contain it too?

3 Caffeine is a natural stimulant found in plants.

© Gaillard / Jerrican

Some tea contains caffeine, which stimulates a person's heart beat and provides a burst of energy.

Caffeine is a chemical found in certain plants. In its natural state, caffeine looks like sparkling white crystals. The crystals dissolve in water, which is why we can't see the caffeine in coffee and other beverages.

Wake-up Call

Caffeine acts as a stimulant, which means it speeds up a person's heart rate and provides a burst of energy. Adults generally drink coffee or tea in the morning or when they need to stay awake, such as during long car trips.

A Little Does a Lot

In small amounts, caffeine is not dangerous to most people, but large doses of caffeine can cause physical problems. It can make a person restless or anxious, and it can cause him or her to have trouble sleeping. This is why adults generally don't drink coffee before bedtime.

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Which is the knife used by a surgeon?

MEDICINE

1. Forceps
2. Scalpel
3. Suture

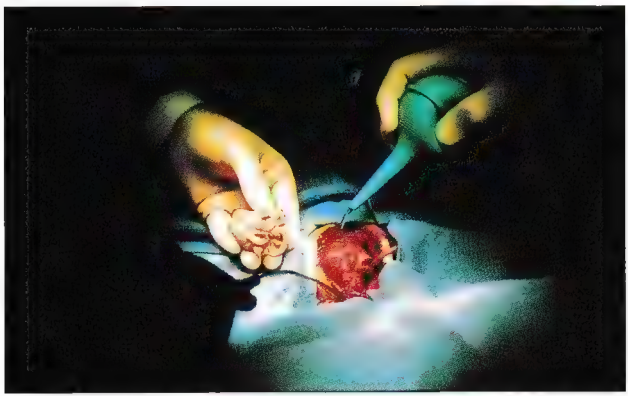
Illustration Gary Fields

©1996 Nintendo

Surgery

The branch of medicine that deals with operations to repair injuries, correct physical defects, and cure certain diseases is called surgery.

2 **A scalpel is a knife used by surgeons.**



© Len Sirman

Cardiac surgeons repair heart problems by operating to remove blockages and correct defects. Surgeons need steady hands and lots of stamina—some operations take several hours to perform.

Many medical problems can be treated with medication, but some must be physically repaired. That's where a surgeon comes in. Surgeons remove growths and tumors, repair damaged organs, and set broken bones. They're surgical tools include special tweezers called forceps and sharp, thin-bladed knives called scalpels.

Historic Surgery

If an organ is so weak or damaged it can't be repaired, a surgeon might replace it with a healthy one. This is called a transplant. The first successful transplant was done in the U.S. in 1954 when Dr. Joseph Murray transplanted a kidney from one patient to another. The first heart transplant was done in South Africa by Dr. Christian Barnard in 1967. Though the patient only lived for 18 days after the operation, it paved the way for further development. Today about 1,500 heart transplants are performed each year.

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Why are patients given anesthesia before surgery?

MEDICINE

1. To suppress pain
2. To regulate heartbeat
3. To maintain respiration

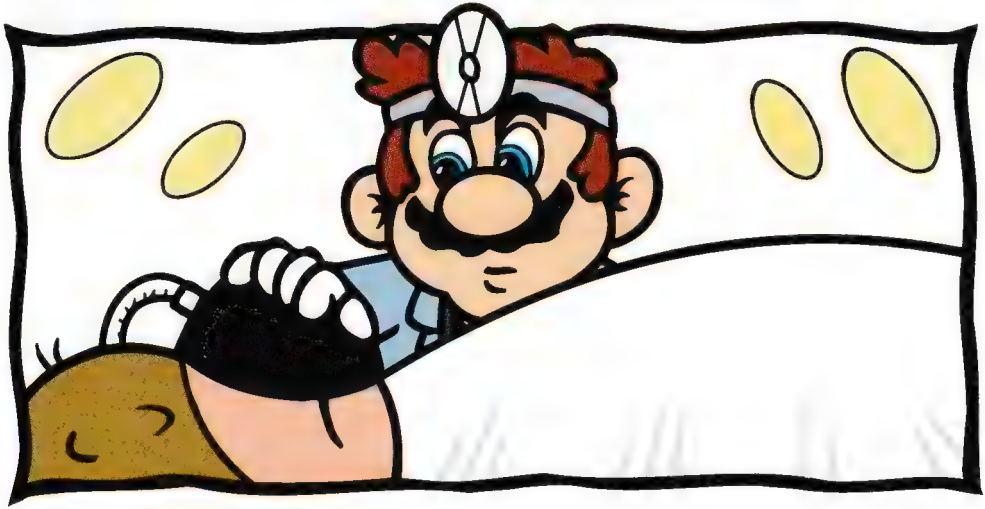

Illustration Gary Fields

©1996 Nintendo

Anesthesia

Before surgery or other medical procedures patients are given anesthesia to reduce the amount of pain they feel during the operation.

1 Anesthesia reduces the pain a patient feels during an operation.

© Len Sirman

In an operating room, the anesthesiologist is the doctor responsible for giving the patient anesthesia. During the operation, the anesthesiologist makes sure that the patient's breathing and heartbeat remain normal.

In anesthesia, drugs are used to temporarily deaden nerves and reduce a patient's sensibility to pain. Without anesthesia, complicated procedures like open heart surgery would be nearly impossible. Such operations take hours, and most patients could not stand such prolonged pain.

General or Local

General anesthetics make the patient lose consciousness for a period of time. They're usually used for lengthy operations. Local anesthetics just deaden nerves in a particular area. Dentists often use a local anesthetic to numb a tooth before filling it.

Brief History

In 1842, American surgeon Crawford Long was the first to use the general anesthetic ether in surgery. Later chloroform was also used for general anesthesia. These drugs are usually administered as gas which the patient inhales. Local anesthetics, such as adrenalin and novocaine are usually injected.

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Which plant can be used to soothe burns?

MEDICINE

1. Aloe
2. Feverfew
3. Lemon Verbena

Illustration: Gary Fields

©1996 Nintendo

Medicinal Plants

Ancient Chinese physicians were the first to use herbs and plants as medicines. Many of today's medicines were first used in China over 3,000 years ago.

1 **Aloe is used to soothe burned skin.**

© J. M. Fichaux / Sunset

Medieval herbalists found that a tea made from leaves of a lime tree helped patients sleep.

In ancient civilizations all over the world, people looked for ways to treat illness and injury. Plants seemed an obvious place to start. There were lots of them, and each had a different taste, smell, and texture. These early medicine people figured they also had different uses, so they began to experiment. They gave patients leaves or berries to chew, they made aromatic wraps from herbal oils, or tea from leaves and bark. Sometimes remedies worked; other times they poisoned the patient. These ancient experiments became the basis of all drug research.

Ancient Remedies

Chinese herbalists found *ma-huang,* or ephedra, was a good decongestant. Australian Aborigines were the first to use eucalyptus to treat nasal and chest congestion. Ancient Egyptians used aloe to heal burns. Ancient Greeks used feverfew to cure fevers and headaches. Amazing but true…we still use these ancient remedies today!

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What is a decibel?

MEDICINE

1. A type of alarm system
2. The communications system on warships
3. Unit for measuring the intensity of sound

Illustration: Gary Fields

©1996 Nintendo

Decibels

On the decibel scale, sounds measuring 0 decibels are barely detected by the human ear. The louder the sound, the higher its decibel level.

3 A decibel is the unit for measuring the intesity of sound.

© M. Garnier / Explorer

People who work in extremely noisy environments, such as construction sites, wear protective ear coverings to reduce their risk of hearing loss.

The decibel scale is used to measure the intensity, or loudness, of sound. Decibel is abbreviated dB. By classifying different sounds at different decibel levels scientists can compare the intensity of various noises in relation to each other. Doctors use the decibel scale to determine how noises of different intensities affect the human ear.

Pleasant to Painful

On the decibel scale, an increase of 10 dB is equal to about two times the intensity of a sound. So, if 0 dB represents sounds we can barely hear, then the sound of leaves rustling in the wind measures about 10 dB. An ordinary conversation measures about 60 dB; a lion's roar, about 90 dB. Constant exposure to sounds above 70 dB can damage a person's hearing. Sound above 130 dB—about the intensity of a rock concert or a jackhammer—can cause immediate hearing loss and physical pain.

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What is the average life expectancy of an American person?

MEDICINE

1. 70 years
2. 80 years
3. 100 years

Illustration Gary Fields

©1996 Nintendo

Life Expectancy

Depending on their genetic make-up, the type of medical care they receive, and the food they eat, people in different parts of the world have different life expectancies.

1 **The average life expectancy for Americans is 70 years.**

© Len Sirman

Primitive societies, such as the Indian communities in South America, generally have shorter life expectancies than those of civilized societies.

As the quality of nutrition and medical care has improved over the centuries, the average life expectancy in the United States has increased dramatically. In Colonial times, the average life expectancy was only 30 years! One reason life expectancy was so short in the 1700s was that many babies and children died at young ages. Common diseases like measles or influenza were life-threatening to kids in Colonial times. Now that there are vaccines to prevent many childhood diseases, and medicines to treat illnesses like the flu, today's kids grow up healthier and live longer.

Around the World

Life expectancies vary from country to country. In nations where medical care is not readily available to most people, the average life expectancy is shorter. Malnutrition and poor sanitation lead to diseases which can reduce life expectancy.

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What is a vegetarian?

MEDICINE

1. A person who does not eat meat
2. A type of nutritionist
3. A doctor who treats skin diseases

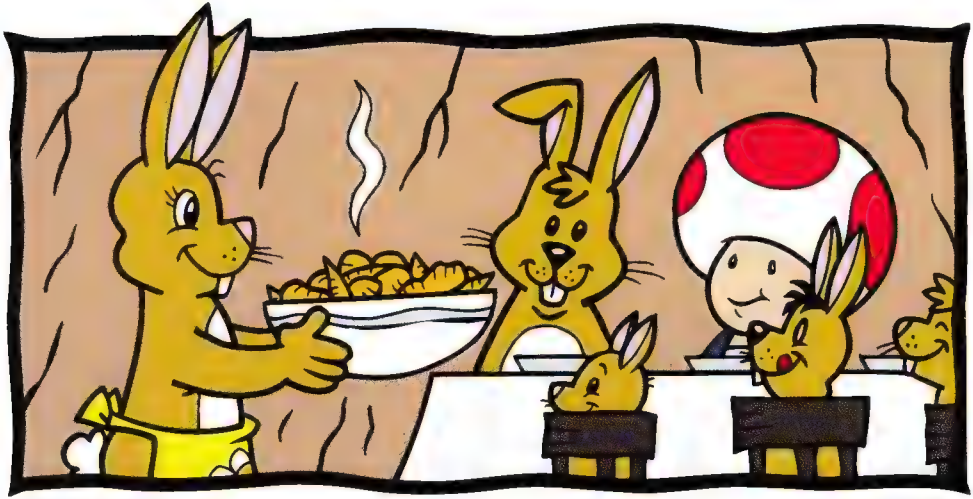

Illustration: Gary Fields

©1996 Nintendo

Vegetarian

Some people prefer not to eat meat for nutritional reasons. Others eliminate meat from their diets for ethical or religious reasons.

A vegetarian is a person who does not eat meat.

© Taulin

A vegetarian diet consists mainly of vegetables and grains.

Meat can contain high levels of fat and cholesterol. People who want to reduce the amount of fat they consume sometimes stop eating meat. Meat comes from animals, such as cows, chickens, and pigs. Many people become vegetarians because they don't think it's right to kill animals for food. Others are vegetarians because the religions they practice prohibit the consumption of meat.

Nutritional Balance

No matter what their reasons for choosing to eliminate meat from their diets, vegetarians must balance their food intake to be sure they consume all the vitamins and nutrients their bodies require. For example, meat is a primary source of protein and iron in most people's diets. Since vegetarians don't eat meat, they have to consume protein and iron in other ways. Legumes, such as peas and beans, are vegetable sources of proteins. Dark green vegetables, such as spinach and broccoli, contain iron.

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Why do some foods have to be cooked?

MEDICINE

1. To kill harmful bacteria
2. To make them easier to digest
3. Both

Illustration: Gary Fields

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Cooking

In some foods, such as rice, cooking releases nutrients contained in the food. Uncooked rice would be hard to chew and hard for your body to digest.

3 Some foods must be cooked to make them easier or safer to eat.

© Bao Cao / Explorer

Dried peas and beans have to be soaked in water and then cooked so you can chew them and your body can digest them.

Meat and eggs may contain bacteria or parasites that can be harmful to humans. Trichinosis, for example, is a disease caused by parasites found in raw pork. Salmonellosis can be caused by bacteria in raw eggs. Both illnesses cause severe stomach pains and can be serious. Cooking kills the bacteria and parasites, and makes the food safe for people to eat.

A Feast for the Nose

Besides making food safe to eat and easier to digest, cooking makes food more appetizing. Heat releases the aromas of foods and the aromas make you feel hungry. (Think of the smell of chocolate cake as it bakes!)

What's Cooking?

Cakes are baked. Meats are roasted, broiled, and sometimes fried. Vegetables are usually prepared by steaming, which cooks them quickly and retains their vitamins. Some cooks prefer not to fry any foods because oil used to fry adds fat and calories to foods.

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What does a dermatologist treat?

MEDICINE

1. Mental illness
2. Diseases and conditions of the skin
3. Respiratory ailments

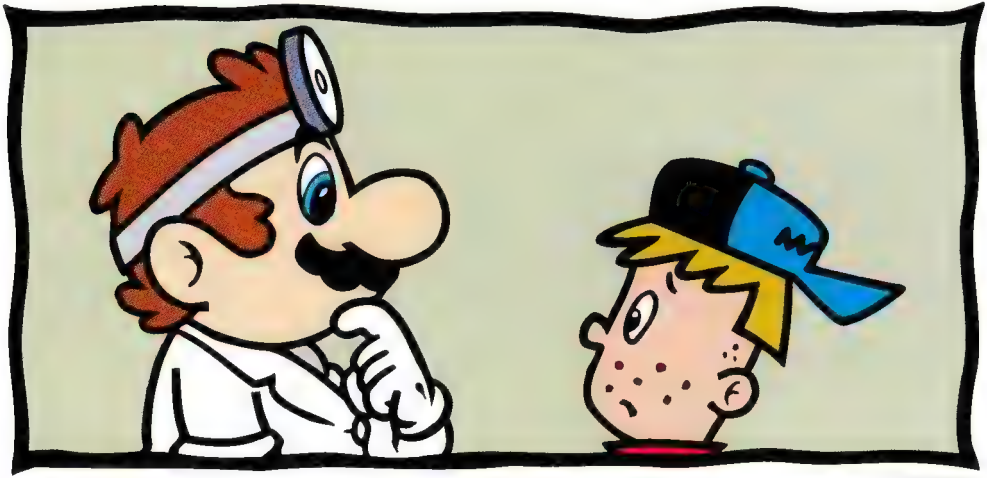

Illustration: Gary Fields

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Dermatology

The word dermatology comes from the Greek word *dermatos*, which means "skin."

2 A dermatologist is a doctor who treats diseases and conditions of the skin.

© A. Sauzet / Explorer

A dermatologist would tell this woman that tanning is bad for her skin. To protect your skin from the Sun's harmful rays, always wear a protective sunscreen.

Your skin is one of your body's major organs, just like your liver or your heart. Skin is the sensory organ of touch. It protects your body's internal organs from disease and damage. It also helps regulate your body temperature. When you're hot, the pores in your skin give off perspiration that cools you down.

Taking Care

Keep your skin healthy by keeping it clean and protecting it from the sun. Sunburn and tanning (which is really a mild form of sunburn) can permanently damage your skin.

A Doctor's Help

Sometimes skin requires a doctor's care—like when you walk into poison ivy and wind up with a painful, itchy rash. That's when you might visit a dermatologist who can prescribe medicine to heal you. Dermatologists treat all sorts of skin conditions, from acne pimples to athlete's foot. They also treat diseases and conditions that affect the nails, scalp, and hair.

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Which provides vaccines and medical care to developing nations?

MEDICINE

1. UNESCO
2. UNICEF
3. WHO

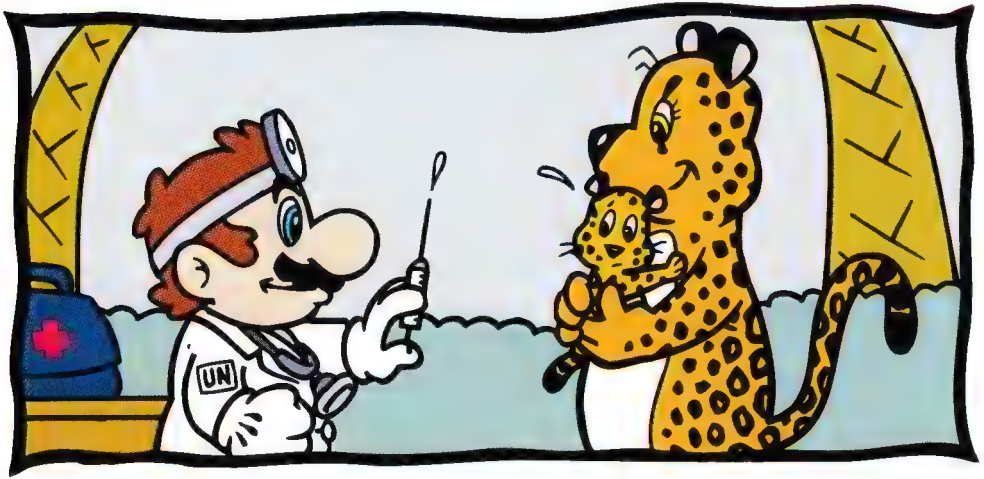

Illustration. Gary Fields

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WHO

Agencies of the United Nations address specific concerns of people worldwide. The World Health Organization, or WHO, helps improve health conditions.

3 The World Health Organization, or WHO, is the United Nations' health organization.

© A. Nicolas / Explorer

The World Health Organization distributes medication to people in less developed nations. It also works to vaccinate children and adults against diseases. In 1990, WHO reported that 80 percent of the world's kids had been immunized against six major diseases.

Other U.N. agencies include UNICEF (United Nations International Children's Emergency Fund) and UNESCO (United Nations Educational, Scientific and Cultural Organization).

A Healthy World

WHO is among the biggest, busiest U.N. agencies. One of its tasks is fighting epidemics of disease. To do this, WHO conducts global campaigns to teach people about the importance of vaccinations and to make sure people are vaccinated. Through WHO's work, the disease of smallpox has been wiped out. Its next goal is wiping out polio.

WHO also educates doctors and nurses in developing nations about new and improved medical techniques and medicines. Using information and education provided by WHO, these doctors and nurses can better care for people in their communities.

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Which condition is caused by prolonged exposure to severe cold?

MEDICINE

1. Hypothermia
2. Rickets
3. Somnambulence

Illustration Gary Fields

©1996 Nintendo

Hypothermia

Normal body temperature is 98.6° F (37° C). When a person's body temperature drops below normal, heart rate can slow and body processes can slow down or stop.

1 Hypothermia is caused by exposure to extreme cold.

© p. Wysocki / Explorer

Skiers trapped in avalanches may suffer from hypothermia, but conditions don't need to be this severe for hypothermia to set in. It can occur after prolonged exposure to cold on a winter's day.

There's a reason you shiver when you're cold. Shivering is your body's way of keeping you warm by forcing you to move. In a way, shivering is your body's natural defense against hypothermia.

Your body does a good job of maintaining a constant internal temperature of 98.6°F (37°C), but sometimes external conditions are so severe that your body can't compete with them. The colder it gets, the harder your body fights to stay warm. If your body loses the fight, then the cold starts to do damage.

Warming Trend

This is why it's extremely important to dress warmly during cold weather. Wearing several layers of clothing—like a T-shirt under a shirt and topped with a sweater—helps your body retain warmth. A hat, gloves, and heavy socks keep your extremities—fingers, toes, and earlobes—protected from the cold.

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Which is a condition involving excess loss of body fluids?

MEDICINE

1. Circulation
2. Dehydration
3. Hypertension

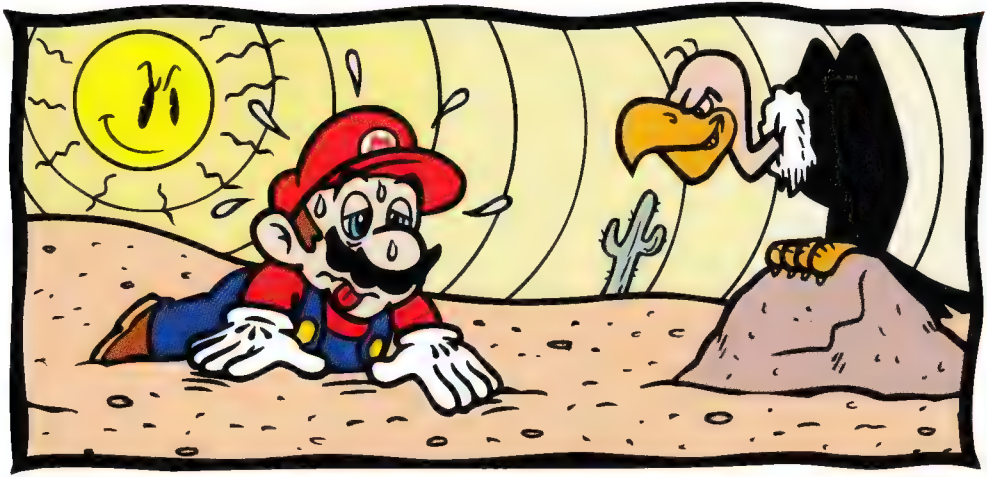

Illustration Gary Fields

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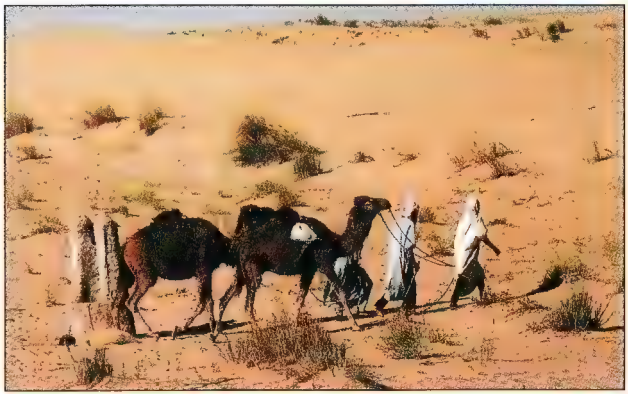
Dehydration

Your body fluids are comprised mainly of water, so your body needs water to survive. When your body gives off more water than it takes in, it may suffer from dehydration.

2 Dehydration is excess loss of body fluids.



© G. Kremer / Explorer

In hot, dry desert climates, risk of dehydration is great. People who live in the desert generally carry water with them. Desert animals, such as camels, become adapted to the hot, dry conditions. Their bodies store the water they need to survive.

When you're running around on a hot day, what's the first thing you crave? Probably a cold drink of water. That's because heat and activity make you perspire, and when your body perspires, it gives off water. So, your craving for a glass of water is just your body's signal that it wants you to replace the water it has lost.

Marathon runners and long-distance cyclists always drink water or sports beverages during a race to keep from becoming dehydrated. If you're going on a full-day hike or bike ride you should always carry a bottle of water with you.

Water for Health

When you're sick it's especially important to drink fluids so that you don't become dehydrated. Flu symptoms, such as fever, diarrhea or vomiting, cause your body to lose water that needs to be replaced so you can feel better.

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Which is a difference between a cold and the flu?

MEDICINE

1. The flu is accompanied by fever; a cold is not.
2. The flu makes you sneeze. A cold makes you cough.
3. You get the flu in summer and colds in winter.

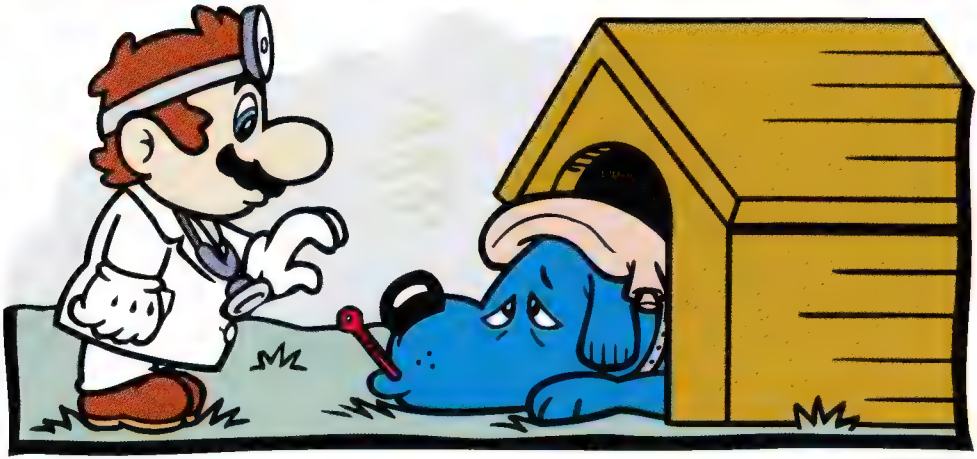

Illustration: Gary Fields

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Colds and Flu

Remember the distinction this way: A fever makes you hot; and when you have a cold, you're not hot.

The flu is accompanied by a fever and a cold is not.

© Lerosey / Jerrican

Breathing warm, moist air from a vaporizer can help relieve nasal congestion caused by a cold or flu.

The medical name for the flu is influenza. It's caused by influenza virus, for which doctors have developed a vaccine. Getting flu shots each year helps some people avoid becoming infected with influenza virus.

Colds can be caused by a number of different viruses. Though doctors have identified some of them, there are no vaccines available that can protect against these viruses.

Congestion

Inside your nose are moist body tissues, called mucous membranes, that warm the air you inhale. When you have a cold, the mucous membranes become irritated and inflamed, making it hard to breathe. Your sinuses, throat, and lungs are lined with similar moist tissues which become irritated when you have a cold.

Don't Share

Colds and flu are highly contagious. Most doctors recommend drinking lots of fluids and resting quietly until the illness runs its course.

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Why is obesity dangerous?

MEDICINE

1. It increases a person's risk of diseases.
2. It makes people short-tempered.
3. It can cause rickets.

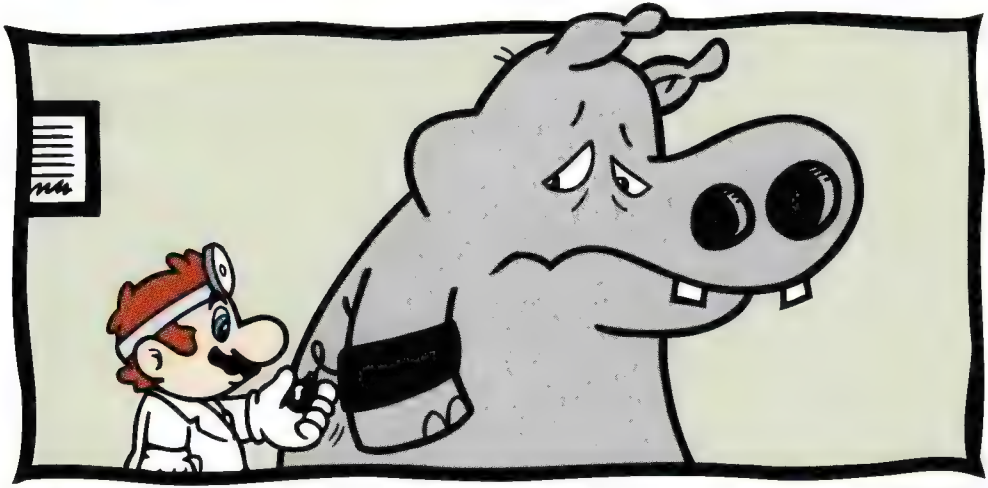

Illustration Gary Fields

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Obesity

The condition of obesity is defined as an abnormal amount of fat on the body. An obese person is more than 20 percent above average weight for his height, age, and gender.

1 Obesity increases a person's risk of diseases.

© Len Sirman

It's okay to be a little overweight, but obesity can be harmful to your health. The best way to maintain a healthy body weight is to eat a balanced diet and to exercise regularly.

Everyone has a certain amount of body fat. Your body needs fat to survive. But medical problems occur when people have too much fat on their bodies.

Excess Baggage

Being obese is like carrying a heavy backpack—the excess weight makes a person tired more easily. It also puts extra stress on the body's bones and joints. This can lead to osteoarthritis, a painful condition that weakens the joints. Obesity also increases a person's risk of contracting diabetes and cancer.

Have a Heart

The most serious effect of obesity is the strain it places on the heart. Excess fat in the body clogs the arteries that carry blood from the heart. This forces the heart to work harder to circulate the blood. Over time, excess strain on the heart raises blood pressure and can lead to heart attacks.

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What causes hiccups?

MEDICINE

1. Changes in altitude
2. Changes in temperature
3. Indigestion

Illustration: Gary Fields

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Hiccups

The word "hiccup" is onomatopoeic, which means it sounds like what it describes. Just like the word "burp"!

3 Indigestion is one cause of hiccups.

© H. Gyssels / DIAF

If hiccups continue over a long period they can be dangerous. Some people think that pinching your nose shut and holding your breath can stop hiccups.

Indigestion is an irritation caused by eating certain foods (or eating too much of certain foods!). Foods that cause indigestion are different for different people. For example, some people get indigestion from spicy foods, some from dairy foods, some from fizzy sodas. It can produce all sorts of effects inside your body. Some foods that cause indigestion give you a stomach ache. Others cause you to burp. And some foods and beverages make you hiccup.

Sudden Spasms

Hiccups are produced by a sudden closing of the glottis, part of your larynx, or voice box. This is followed by a sudden spasm in your diaphragm, a muscle in your abdomen that tenses and relaxes as you inhale and exhale. The spasms in your diaphragm cause you to take a quick gasp of air that travels to your larynx and causes you make a noise that sounds like...hiccup!

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What is a scar?

MEDICINE

1. An outpatient surgical procedure
2. A mark left by the healing of a wound
3. An instrument used to measure blood pressure

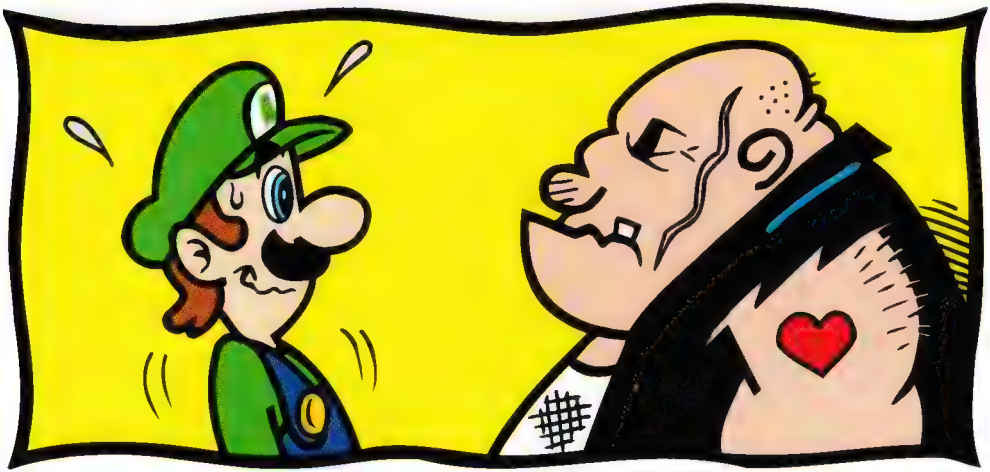

Illustration Gary Fields

©1996 Nintendo

Healing

When the skin is cut or injured it takes time to heal. A scar is the mark left after the body has completed its healing process.

2 A scar is a mark left by the healing of a wound.

© Lovegrove / Science Photo Library / Cosmos

This severe wound was probably stitched closed, or sutured, to help it heal. Now that wound is fully healed, all that remains is a whitish scar.

Your skin and some internal body tissues have the amazing capability of being able to regenerate themselves. When the skin is damaged by a cut or a severe rash or burn, it immediately begins producing new cells to close up the wound. Slowly but surely, the new skin cells form a sort of bridge over the wound to draw it closed. If the wound is severe or deep, a doctor might apply stitches, or sutures, to hold the wound closed so it heals faster.

Connective Tissue

The cells produced during the healing process are different from ordinary skin or tissue cells. They are cells that form connective tissue which replaces the original skin or tissue. At first, they have a red or purple color. When the wound is fully healed, the connective tissue appears white and slightly shiny.

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What is a migraine?

MEDICINE

1. A severe form of headache
2. A type of bandage
3. A skin infection

Illustration Gary Fields

©1996 Nintendo

Migraine

No one knows why some people are more susceptible than others to migraine headaches. It might be a hereditary trait.

1 A migraine is a severe form of headache.

© S.T.F./Sunset

Women are three times more likely than men to suffer from migraines.

Migraine headaches can last for several hours or as long as two or three days. It usually begins with what's called a migraine aura. This is a peculiar sensation that occurs before the real headache symptoms set in. During the aura, a person might have blurred vision, or she might see flashes of light; she might even be temporarily blinded. This is followed by sharp pains in the front of the head. The pain can be so severe that the sufferer can't do anything but go to sleep until it passes.

Little Triggers

Certain events, conditions, and foods have been found to trigger migraines. Changes in altitude or air pressure can be triggers—some people get migraines when air pressure changes right before a thunderstorm. Natural chemicals in aged cheese, red wine, and even chocolate can trigger migraines. Avoiding the triggers can help some people avoid migraines.

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Which is the name for a sensation of dizziness?

MEDICINE

1. Jaundice
2. Sedation
3. Vertigo

Illustration Gary Fields

©1997 Nintendo

Vertigo

When a person suffers from vertigo, she might feel like she's spinning around and can't get her balance, or she might feel that she's standing still but objects around her are moving.

3 Vertigo is a sensation of dizziness.

© M. Colonel / Explorer

Mountain climbers ascend in gradual stages to accustom their bodies to decreases in air pressure. A sudden decrease in air pressure can cause a person to experience vertigo, a sensation of dizziness.

Equilibrium is our sense of balance. Vertigo is a temporary loss of equilibrium. Every time you stand up without feeling dizzy, you can thank your cochlea. This snail-shaped tube in the inner ear controls the body's equilibrium. Inner ear infection or disease may disrupt equilibrium. Decreases in air pressure, like those experienced by deep sea divers coming to the surface or mountain climbers reaching a peak, can also disrupt equilibrium and cause vertigo.

Friends in High Places

Some people associate vertigo with a fear of heights. Vertigo itself is not a fear of heights. However, it can be brought on by a decrease of air pressure in high places. It can also be caused by extreme stress or anxiety. People who are afraid of heights might experience vertigo because they become upset and anxious in high places.

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Can a person be burned by water?

MEDICINE

1 Yes

2 No

Illustration: Gary Fields

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Burns

A burn is an injury to the skin or body tissues caused by excessive exposure to extreme heat, certain chemicals, electricity, or radioactivity.

1 Yes, extremely hot water can burn the skin.

© J. Villegier / Explorer

Never reach for a pot on the stove like this! A pot full of boiling water or cooking food is hot enough to burn you severely and painfully.

People who work with fire or harsh chemicals wear gloves, safety glasses, and long-sleeved clothes to protect their skin from burns.

Three Degrees

Burns are grouped into three categories depending on how severe they are.

First degree burns are painful, but relatively mild. They cause the epidermis, or outer layer of the skin, to turn red and become tender to the touch. A sunburn can be considered a first degree burn.

Second degree burns are more severe. They occur when the heat or burn agent penetrates beneath the epidermis. They cause blisters to appear on the surface of the skin. When the skin eventually heals, it may show scars.

Third degree burns are the most severe. They occur when the burn agent penetrates through all the skin's layers. They kill the skin cells so that the skin is unable to heal.

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Why are some people given stress tests?

MEDICINE

1. To help them relax
2. To test their intelligence
3. To determine their cardiovascular fitness

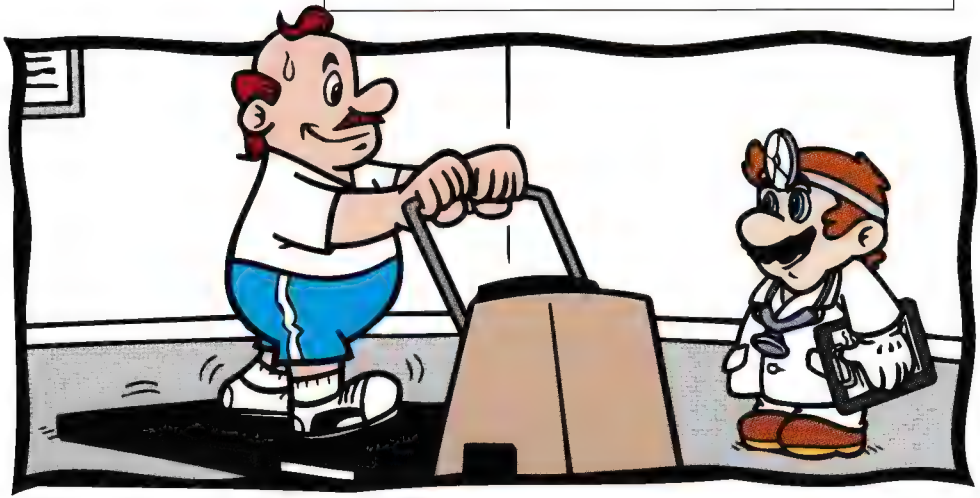

Illustration: Gary Fields

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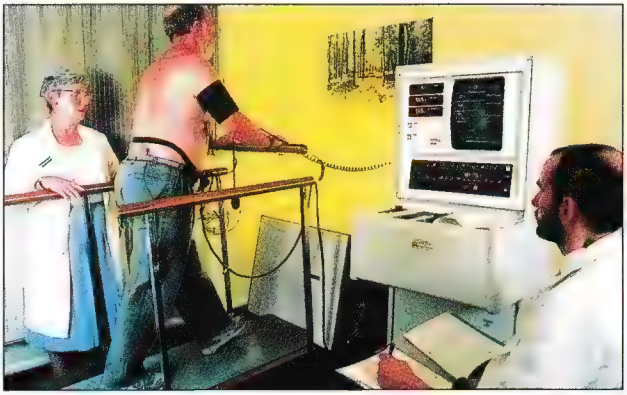
Stress Test

A stress test allows a doctor to monitor a person's heart rate under conditions of physical activity. It's also known as a graded exercise test, or GXT.

3 **People are given stress test to determine their cardiovascular fitness.**



© Len Sirman

Stress Test: While the patient walks on a motorized treadmill, the doctor and medical technician monitor his heartbeat on the electronic screen. The black band around the patient's arm is a device to measure his blood pressure.

To determine the heart's activity in a resting state, doctors perform a test called an electrocardiogram or EKG.

Heart at Work

Since exercise makes the heart work harder than it does in a resting state, a GXT can reveal heart problems a resting EKG can't. The same equipment is used for a resting EKG and a GXT. First, electrodes are placed on the patient's chest. Then the patient begins walking on a motorized treadmill. During the test the exercise is made progressively harder. The doctor wants to see how the heart performs at all levels of activity. The electrodes convert heartbeats to blips on an electronic screen. If the heart's rhythm is uneven, it could indicate a potential heart problem. The GXT alerts the doctor to this possibility so it can be treated or corrected before it becomes more severe.

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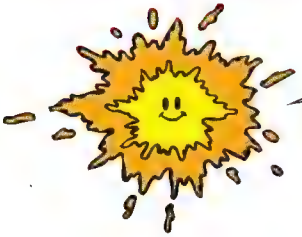
Which is a doctor who specializes in treating children?

MEDICINE



1. Pathologist
2. Pediatrician
3. Pharmacist

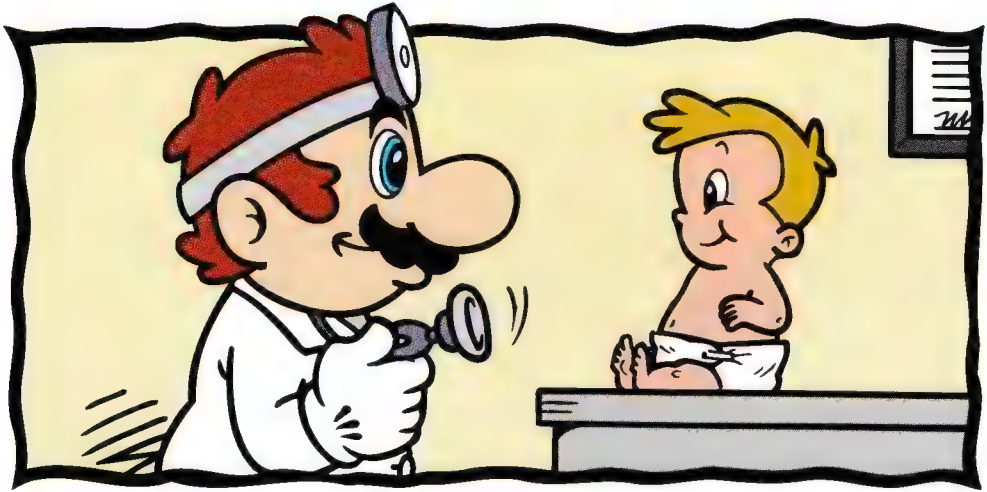


Illustration: Gary Fields

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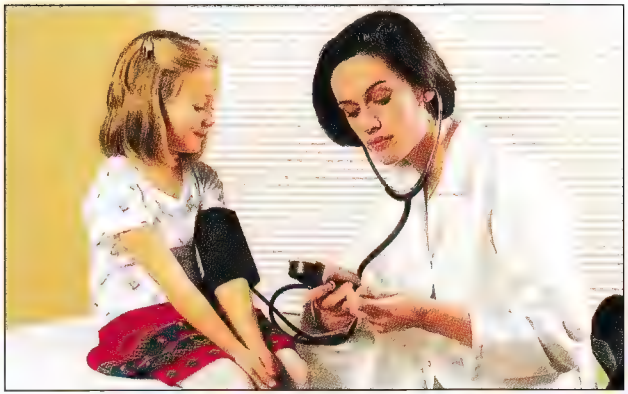
Pediatrician

The word "pediatrics" comes from the Greek words *paido,* meaning child, and *iatrike,* meaning medical care.

2 A pediatrician specializes in treating children.



© Ph. Roy / Explorer

A pediatrician might check your blood pressure, like the doctor in this picture is doing.

To stay healthy, all people, no matter how old they are, should eat nutritious food and exercise. However, sometimes a person's age determines the type of medical care he or she needs. That's why some doctors specialize in treating a particular age group. Doctors who specialize in geriatrics treat elderly people. Doctors who specialize in pediatrics treat kids.

Growing Up Healthy

Kids usually visit a pediatrician once a year, before the school year begins, for a checkup. The pediatrician checks your height and weight, and examines the spine to make sure it's straight and strong. She checks your eyes, ears, nose, and throat for signs of diseases that might require treatment. And she usually gives you shots or vaccinations to keep you from contracting diseases such as measles and mumps.

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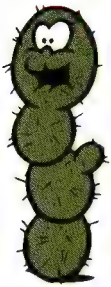
What is serum?

MEDICINE



1. Digestive fluid produced in the stomach
2. Nutritional supplement made from tree sap
3. A liquid contained in the blood

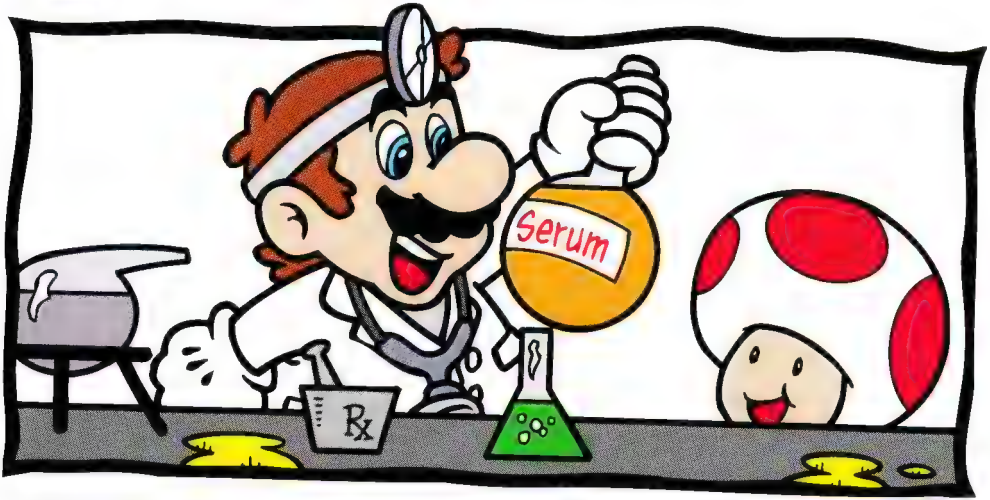


Illustration: Gary Fields

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Serum

Blood is made of a liquid called plasma. Plasma contains nutrients, antibodies which guard against disease, and hormones.

3 Serum is a liquid contained in the blood.

© Sunset

Vaccines called antivenins counteract the effects of an insect or snake bite. Antivenins are made by mixing blood serum with the purified venom of the insect or snake. In this photo, venom is being collected from a snake.

Plasma also contains an agent called a clotting factor which causes blood to harden into a scab over a wound. When the clotting factor is removed from the plasma, what's left is a yellowish fluid called serum.

Carrier Liquid

Vaccines are made by mixing blood serum with antibodies—natural body chemicals that fight disease. Injecting a patient with these vaccines can boost his existing antibodies and help him fend off a disease.

Centrifugal Force

To separate serum from clotting agents, chemists use a device called a centrifuge. Test tubes full of blood are placed in the centrifuge which then spins the test tubes at a very high speed. The spinning motion, or centrifugal force, causes the heavy clotting agent to fall to the bottom of the test tube and the lighter serum to float on top.

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Why do we bandage wounds?

MEDICINE

1. To make them more attractive
2. To aid in the healing process
3. Bandages are required by law

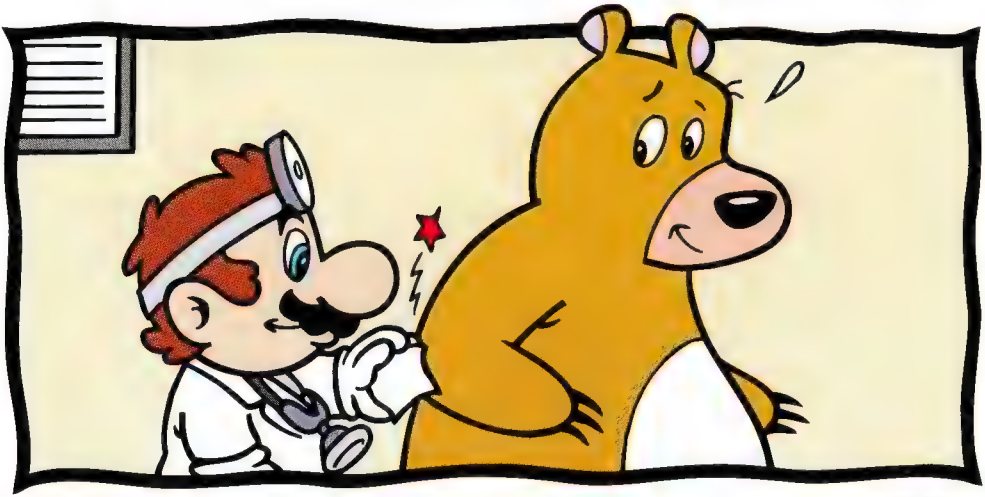

Illustration: Gary Fields

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Bandages

There are two steps to covering a wound to protect it: dressing and bandaging. A dressing covers the wound, and the bandage holds the dressing in place.

2 Wounds are bandaged to help them heal.

© BSIP

Covering a wound with a dressing and bandage keeps out bacteria and dirt, and helps the injury heal.

When your skin is cut, the blood that flows to the wound helps to cleanse the area. White blood cells work to kill bacteria that can enter the cut and cause it to become infected. If the white blood cells didn't fight the bacteria, it could enter your blood stream and make you ill. To help kill the bacteria, you should wash the cut area and gently pat it dry.

Extra Protection

Applying a gauze pad or other dressing to a cut protects the area from further contamination and lets the cut heal safely. Depending on the type and severity of the wound, a doctor might apply antibiotic ointment or other medication to the dressing. Adhesive bandages hold the dressing in place over the wound. They may also be used to hold an injured area in a particular position to keep it from moving until it heals.

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Which medical procedure is used to x-ray the brain?

MEDICINE

1. Angioplasty
2. CAT scan
3. Inoculation

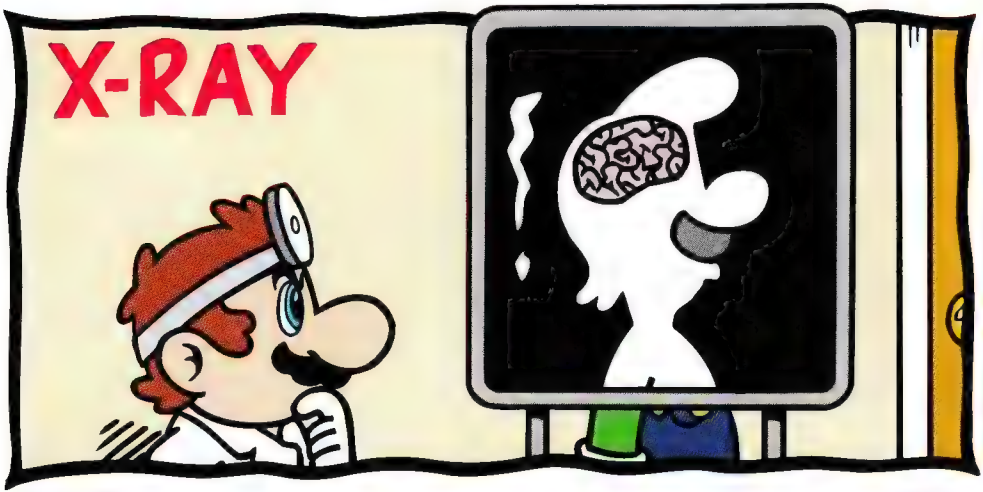


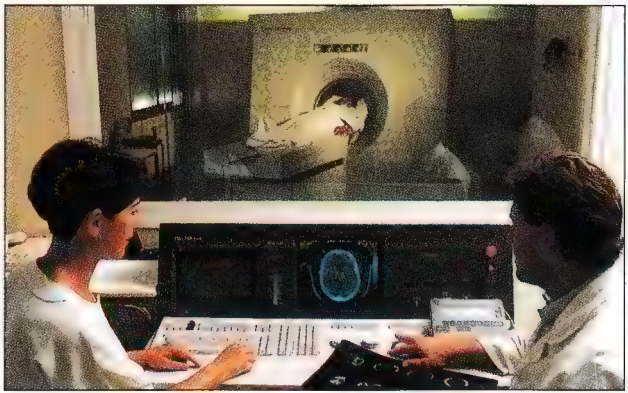
Illustration Gary Fields

©1997 Nintendo

CAT Scan

Computerized axial tomography, or a CAT scan, is a very precise sort of x-ray. The engineer and physicist who developed the technique won the Nobel Prize for medicine in 1979.

2 A CAT scan is used to x-ray the brain.



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These doctors are studying a CAT scan image of the brain. The patient, in the background, lies on a gantry with his head inside the scanner. The image of his brain appears on the computer screen.

A CAT scan is used to find diseased, damaged, or injured areas of internal organs such as the liver, kidneys, or the brain.

High Technology

A patient undergoing a CAT scan lies on a narrow table, called a gantry, which slides into the scanner. The scanner gives off an x-ray beam that travels all around the part of the body being studied. The radiation passes through the body and is detected by sensors inside the scanner. A computer takes the information the sensors pick up and converts it into a picture of the scanned area. This picture appears on the computer screen. It looks like a series of bright and dark patches. The brighter the area, the more radiation passing through it. If a dark patch appears in an area that should appear bright, it could indicate a tumor or blockage that needs to be removed.

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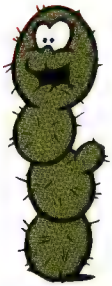
Which profession concerns the study of nutrition for good health?

MEDICINE



1. Dietetics
2. Podiatry
3. Radiology

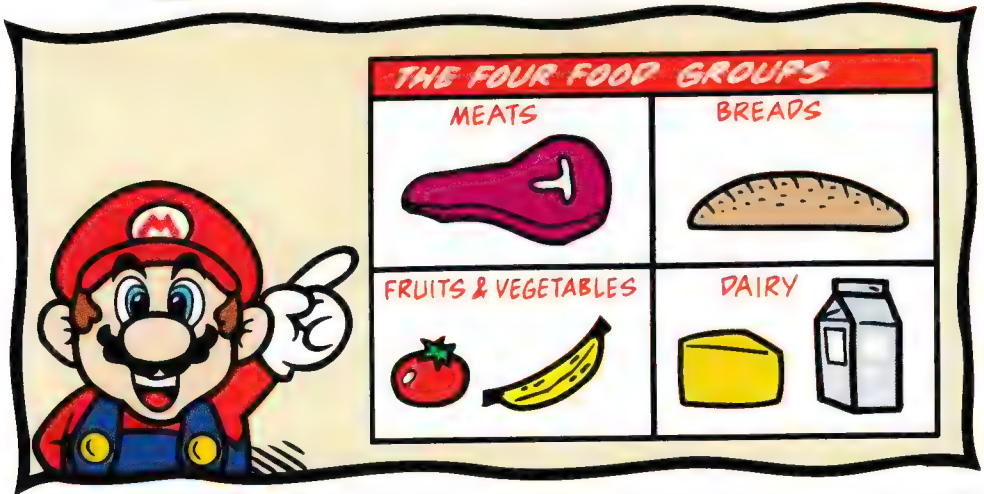


Illustration: Gary Fields

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Dietetics

People who study dietetics are called dietitians. They create menus that are nutritionally balanced and healthy.

1 Dietetics concerns the study of nutrition for good health.

© Ph. Roy, Explorer

Dietitians aren't chefs, they're medical professionals. They make recommendations about the foods a person should be eating to provide his or her body with necessary nutrients.

Eating foods from the four food groups—meat, dairy, grains, and fruits and vegetables—every day provides the nutrients the body needs to function and grow. However, some people can't eat foods from all four food groups. For example, a person might be allergic to dairy foods or to wheat, the grain that's used to make most breads. That person has to find other foods to provide the nutrients, vitamins, and minerals his diet is lacking.

Healthy Diet

Dietitians create balanced menus for people with specific health problems or conditions. Dietitians also work at schools and hospitals to develop nutritionally balanced menus for students and patients. Some work with professional sports teams to develop menus that provide athletes with the nutrients they need to perform at peak level.

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Which is not a dairy product?

MEDICINE

1. Butter
2. Hamburger
3. Muenster cheese

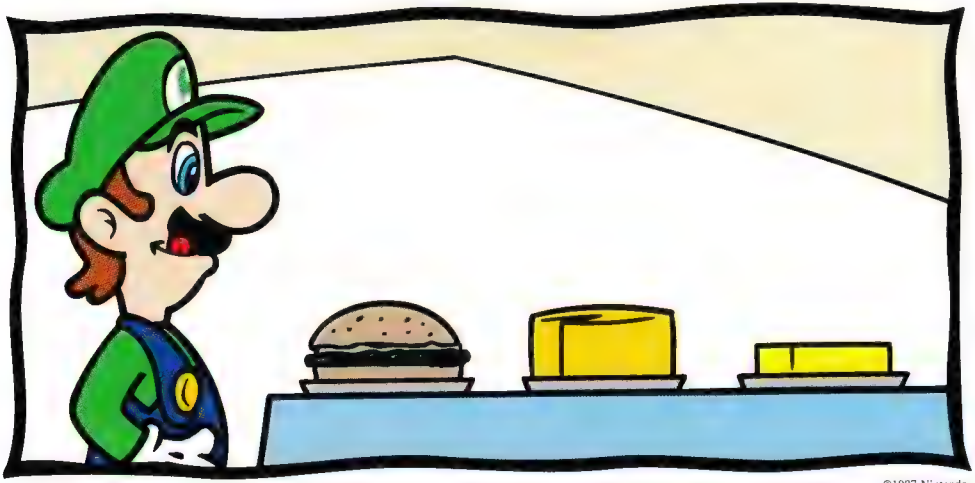

Illustration: Gary Fields

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Dairy Foods

Foods which contain milk are known as dairy foods. They include cheese, yogurt, and ice cream.

2 Hamburger is not a dairy product.

© Gaillard / Jerrican

Dairy foods include cheeses of all types—from cheddar to cottage cheese—milk, yogurt, and ice cream. Butter is also a dairy food, though it is high in fat and low in calcium.

Dairy foods are our most important source of dietary calcium. Calcium, a mineral, is a key ingredient for the formation of healthy bones and teeth. Because kids grow at a rapid rate, they need to eat lots of calcium-rich foods to help their bones become strong and hard. The recommended dietary allowance (RDA) of calcium for people ages 11 to 24 is 1,200 milligrams. Over age 25, when the body's growth has slowed, the RDA is 800 milligrams.

Calcium Counts

Other people need calcium-rich diets too. Pregnant women need calcium to help their babies to grow. Older people, particularly women, need calcium to prevent their bones from weakening. The disease in which bones become thin and prone to breakage is called osteoporosis.

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Which food is rich in proteins?

MEDICINE

1. Apple
2. Meat
3. Potato

Illustration: Gary Fields

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Protein

Your body produces some proteins, but the rest of the proteins you need have to be consumed in your diet.

2 Meat is rich in protein.

© D. Bernard

Meat and fish are among the foods that contain complete proteins. Vegetarians and other people who don't eat meat or dairy products get their dietary protein by eating combinations of foods, such as beans and rice, that contain all the essential amino acids.

Proteins are necessary for growth, and for the development and reproduction of muscle cells. The protein collagen makes your skin elastic and it forms the ligaments that hold your teeth in place. Hemoglobin is a protein that carries oxygen in the blood. Some proteins help protect your body against disease.

Building Blocks

Amino acids are the basic units of proteins. There are about 80 amino acids, and 20 of those are necessary for the body's growth and development. Your body produces some amino acids, and the rest—about half—must be consumed in the foods you eat. These are called essential amino acids. Various foods contain different amounts and kinds of amino acids.

Proteins containing all the essential amino acids are called complete proteins. They're found in milk, cheese, eggs, and meat. Proteins contained in vegetables and grains are incomplete proteins.

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When is artificial respiration used?

MEDICINE

1. When a person is dehydrated
2. When a person is asleep
3. When a person's breathing has stopped

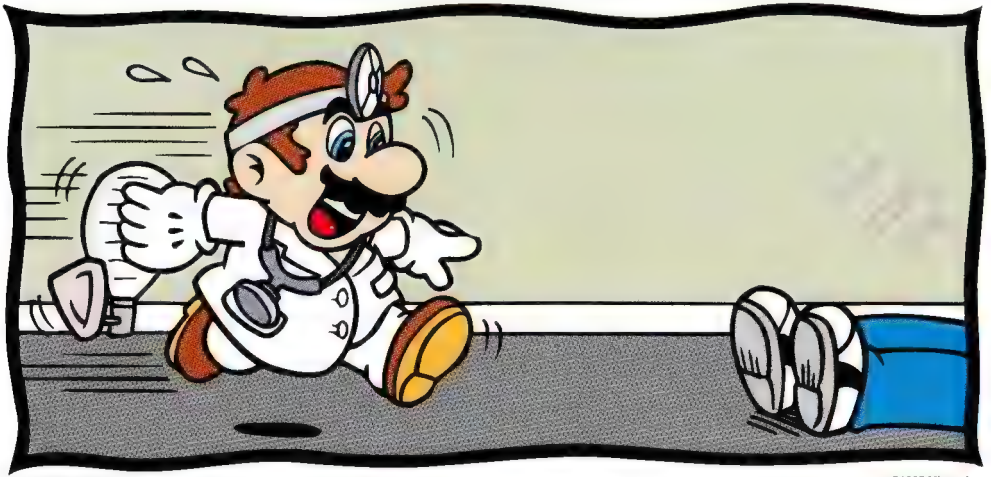

Illustration: Gary Fields

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Artificial Respiration

Paramedics and rescue workers use mouth-to-mouth resuscitation to revive victims who have stopped breathing.

3 **Artificial respiration is used when a person's breathing has stopped.**

© Maso / BSIP

Victims of accidental drowning, choking, or smoke inhalation are sometimes given oxygen masks, like this one, to help them breathe.

It takes about five seconds to determine if a person's breathing has stopped. If you can't hear the victim breathing, and you don't see his chest rise and fall, then he's not breathing and action must be taken.

Mouth-to-Mouth

The victim should be placed on a flat surface, with arms at his sides and his head tilted back slightly. Tilting the head keeps the tongue from blocking the air passage in the throat.

Gently pinch the victim's nose closed, take a deep breath, and place your mouth over his mouth to form a seal. Then exhale through your mouth for one full second, inhale and exhale again.

If the victim still doesn't breathe, the air passage to the lungs could be blocked. Place one hand on top of the other and press quickly and sharply on the victim's stomach to dislodge the blockage.

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Can the human heart be replicated by an artificial heart?

MEDICINE

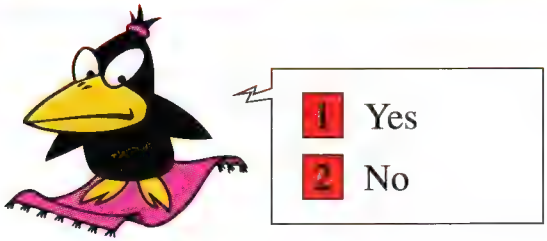

Illustration Gary Fields

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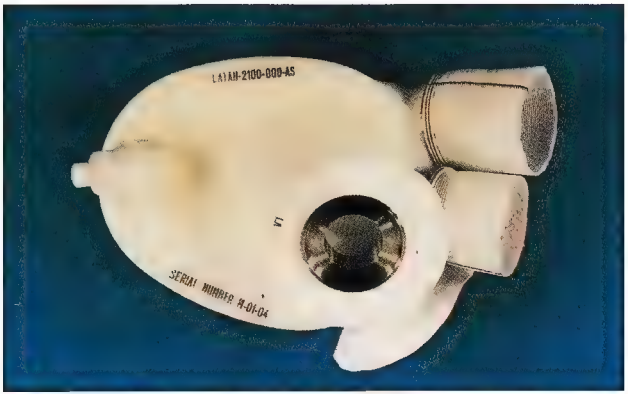
Artificial Heart

The first artificial heart implant was done by Dr. Robert Jarvik in 1982. The heart kept the patient alive for 112 days.

1 Yes, human hearts have successfully been replicated by artificial hearts.



© R. Gaillarde / Gamma

This version of the artificial heart resembles a human heart. Artificial hearts are intended to work as blood pumps so that patients with diseased or severely damaged hearts can live.

Though the implant of the Jarvik-7 artificial heart didn't have long-term success, it provided the incentive for other medical researchers to invent better artificial hearts. Today there are new and improved artificial hearts that have shown promise for long-term success.

In a Heartbeat

The artificial heart is a mechanical device that it surgically implanted in a patient's chest. Usually, the patient's weak or malfunctioning heart is left in place. The artificial heart is added to assist the natural heart. After the artificial heart has been implanted, the patient is fitted with a battery pack that he or she wears at all times. Cables from the artificial heart inside the patient's body are connected to the battery pack outside the patient's body. The batteries keep the artificial heart charged and pumping.

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What branch of dentistry specializes in correcting the position of teeth?

MEDICINE

1. Oral surgery
2. Orthodontia
3. Periodontia

Illustration: Gary Fields

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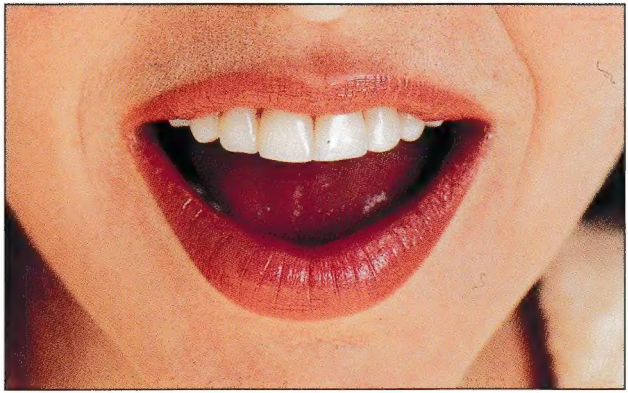
Orthodontia

An orthodontist is the dental specialist who fits kids and teenagers—and sometimes adults—with braces to correct the position of their teeth.

2 Orthodontia corrects the position of teeth.



© E. Bernager / Explorer

Once a person has received orthodontic treatment, her smile usually looks more attractive. But correcting the bite and position of the teeth isn't just a cosmetic procedure. If the bite isn't aligned properly it can lead to headaches and jaw problems in adulthood.

Kids have generally lost all of their "baby" teeth by the time they're seven or eight years old. When their adult, or permanent, teeth grow in, they don't always grow in straight. One reason for this is that the teeth may simply be too big for the mouth. As they come in, they crowd each other for space.

The Case for Braces

To accommodate the new teeth, a device called a palatal expander is used to stretch the mouth. This is usually done when a kid is about 8 or 9 years old. It takes a few months, and it hurts a bit.

If braces are needed to correct the bite or straighten the teeth, an orthodontist usually fits them when the child is about 12 years old. It takes about two years for the braces to correct the position of the teeth. Once a month the orthodontist tightens and adjusts them.

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What is an allergen?

MEDICINE

1. Substance that provokes an allergic response
2. Medicine to treat an allergy
3. Doctor who specializes in treating allergies

Illustration: Gary Fields

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Allergy

Common allergens are dust, pollen, and animal dander. These airborne particles make some people sneeze.

1 An allergen is a substance that provokes an allergic response.

© S.T.F. / Sunset

Dust is a common airborne allergen. Other common allergens include foods such as wheat, chocolate, and strawberries. Chemicals and some medications produce allergic reactions in some people, too.

Allergens are common substances that can provoke uncommon responses. The body reacts to an allergen by producing antibodies to fight it off, as if it were a germ or virus. Allergy symptoms can be similar to cold or flu symptoms. They include sneezing, watery eyes, and nasal or chest congestion.

Allergy on Contact

The allergic reaction is cause by chemicals called histamines which exist inside the body. When histamines are released in response to an allergen they cause blood vessels to swell. This makes it hard to breath. It also can produce a rash or hives on the skin. People who are allergic to certain chemicals or foods often break out in hives if they eat or touch these allergens.

Medicines called antihistamines are used to treat allergies. (They are also used to treat cold symptoms.) They counteract the effects of histamines.

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